

Soil Boring/Surface Sample Investigation Report West Lake Landfill Radiological Areas 1 & 2

APPENDICES H, I

Bridgeton, Missouri

November 26, 1996

Site: West Lake Lndfill
ID #: MA0079900932
Breaks: 3.3
Other: DU #1; McLaren/Hart
11-26-96

Prepared for:
West Lake Respondent Group

Prepared by:
McLaren/Hart
Environmental Engineering Corp.



40056506
SUPERFUND RECORDS

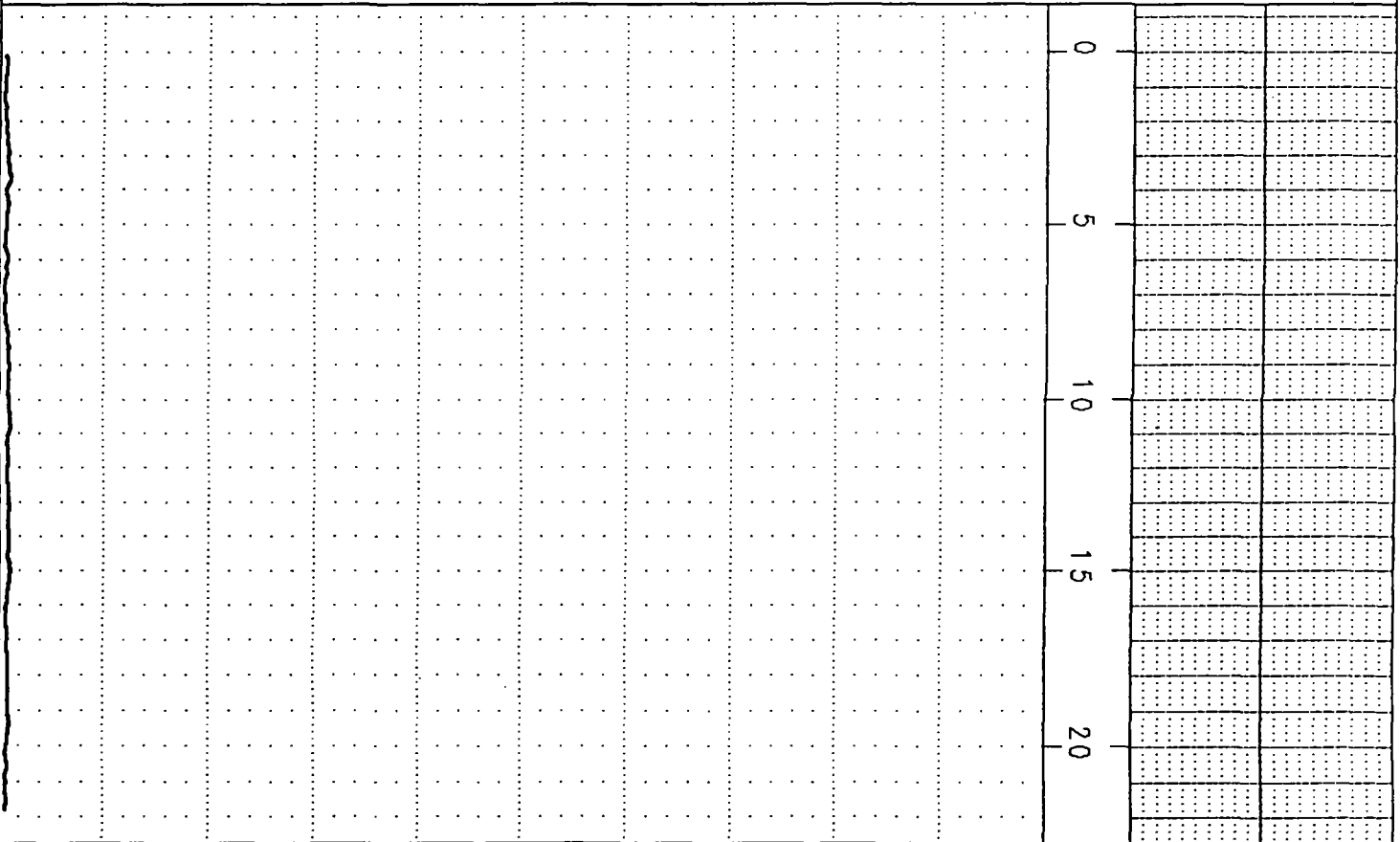


**Area 1 Soil Boring
Downhole Gamma Logs**

(C:\WESTLAKE\WL101.GB0)

COLOG

NGamma
CPM 0 600000



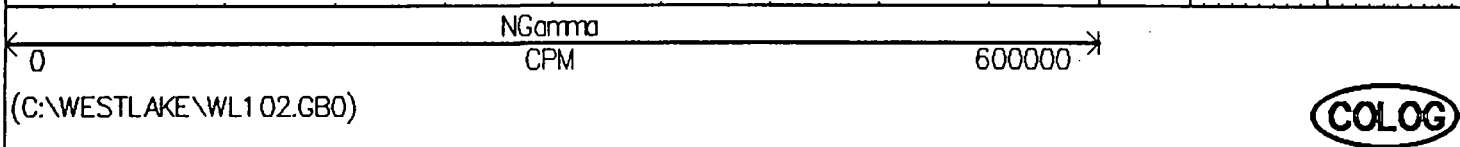
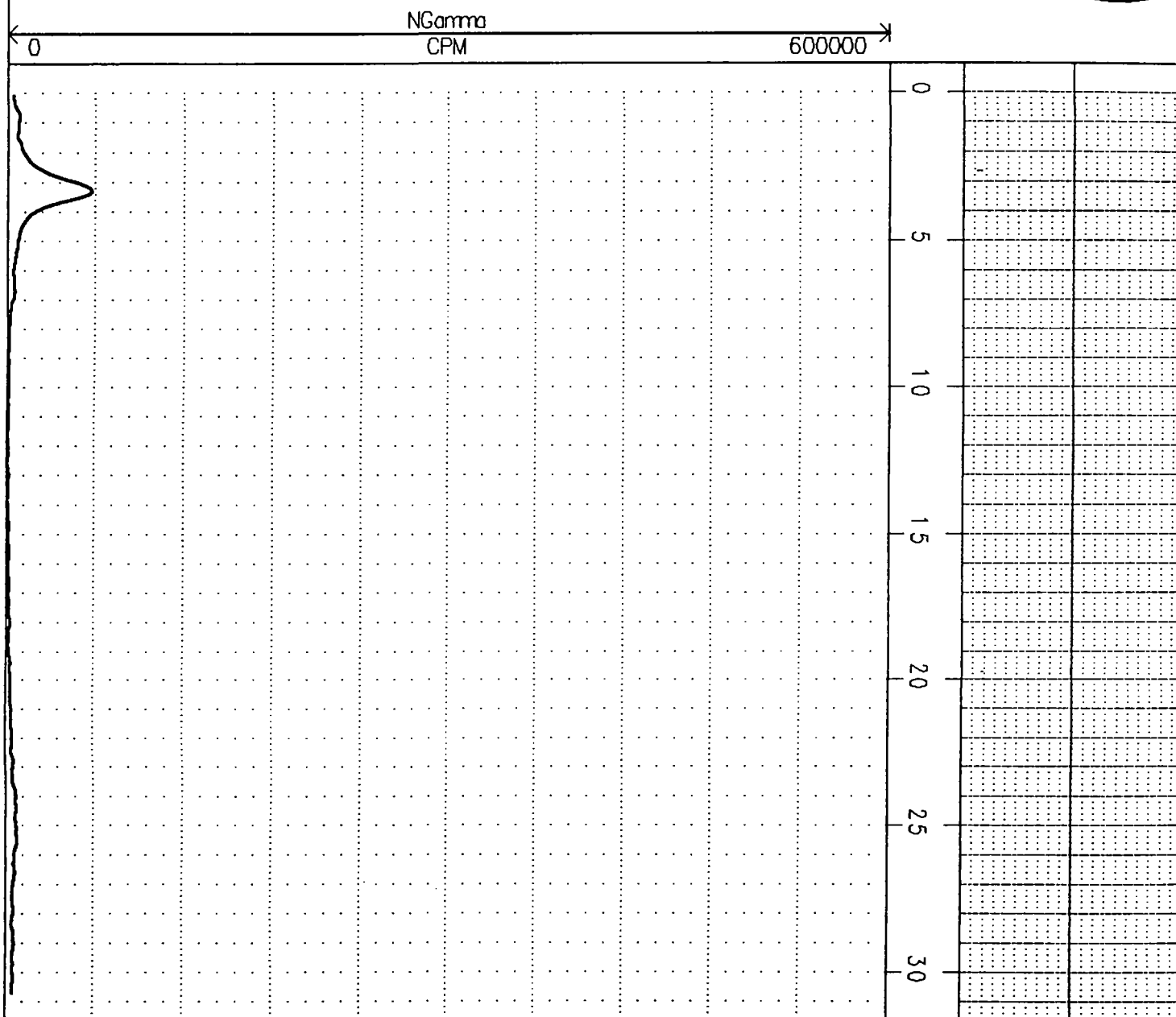
NGamma
CPM 0 600000

(C:\WESTLAKE\WL101.GB0)

COLOG

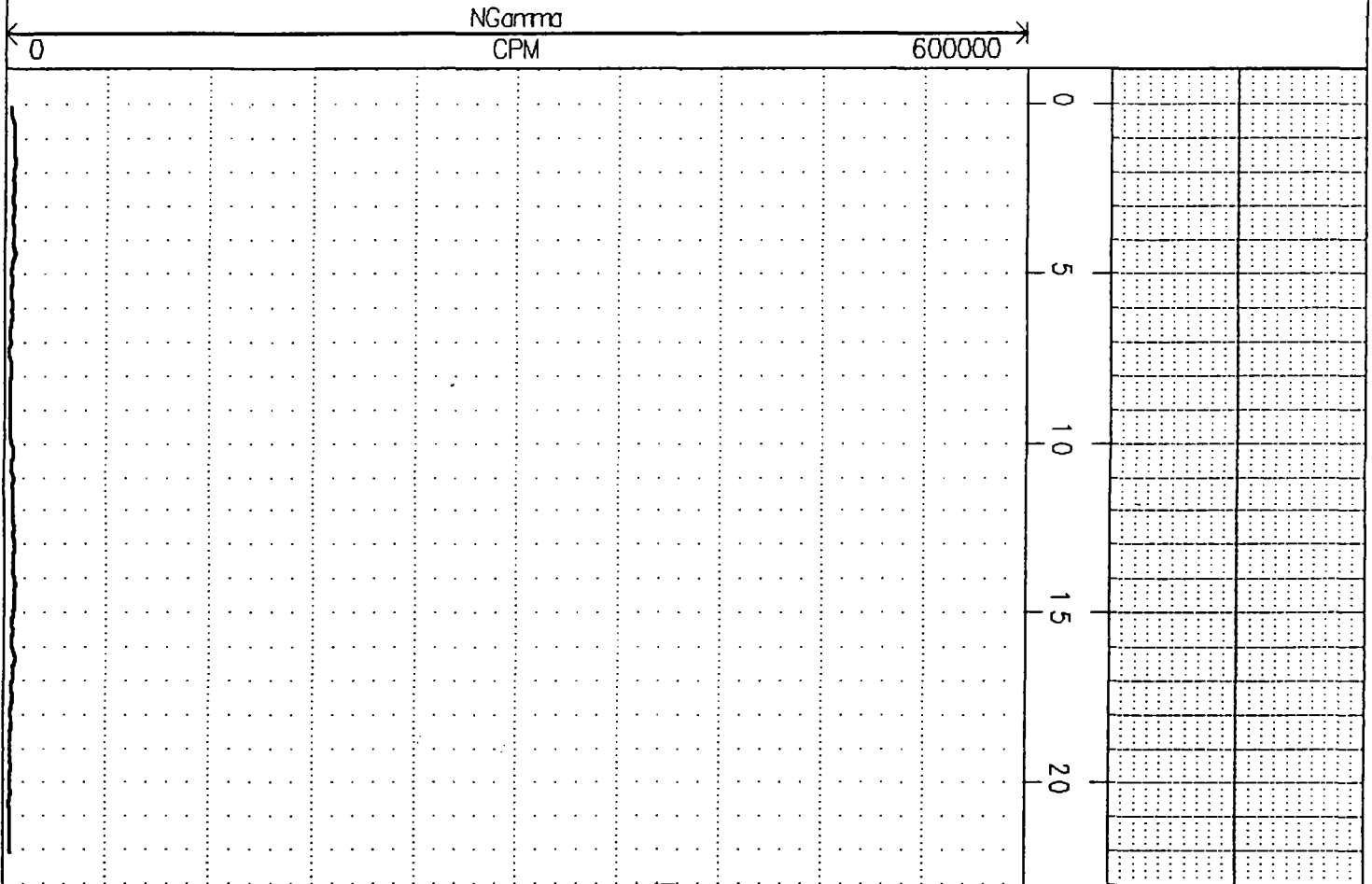
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COLOG



(C:\WESTLAKE\WL103.GB0)

COLOG



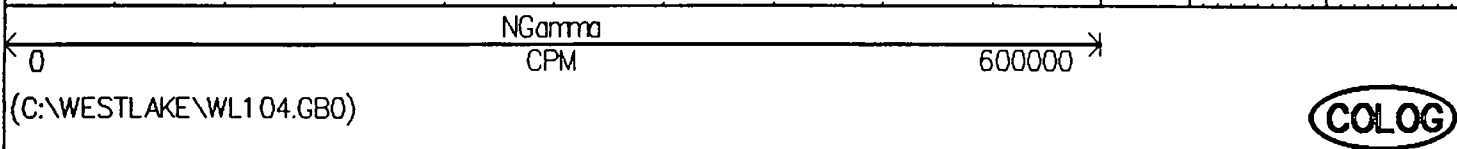
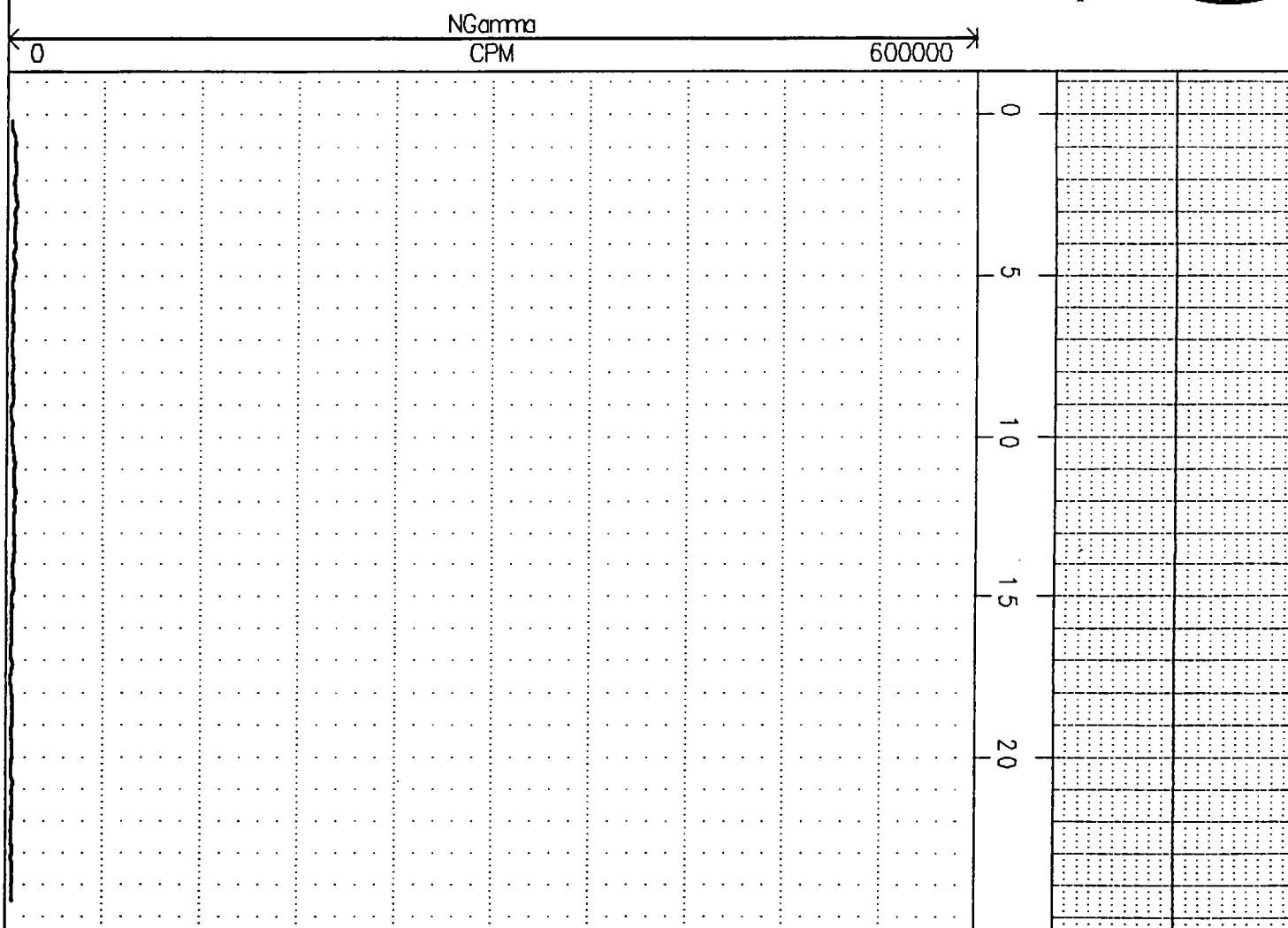
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COLOG

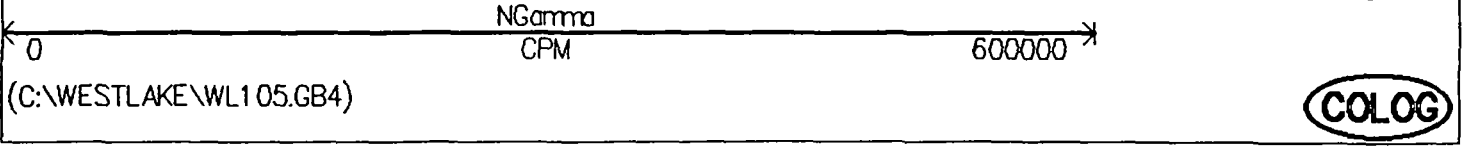
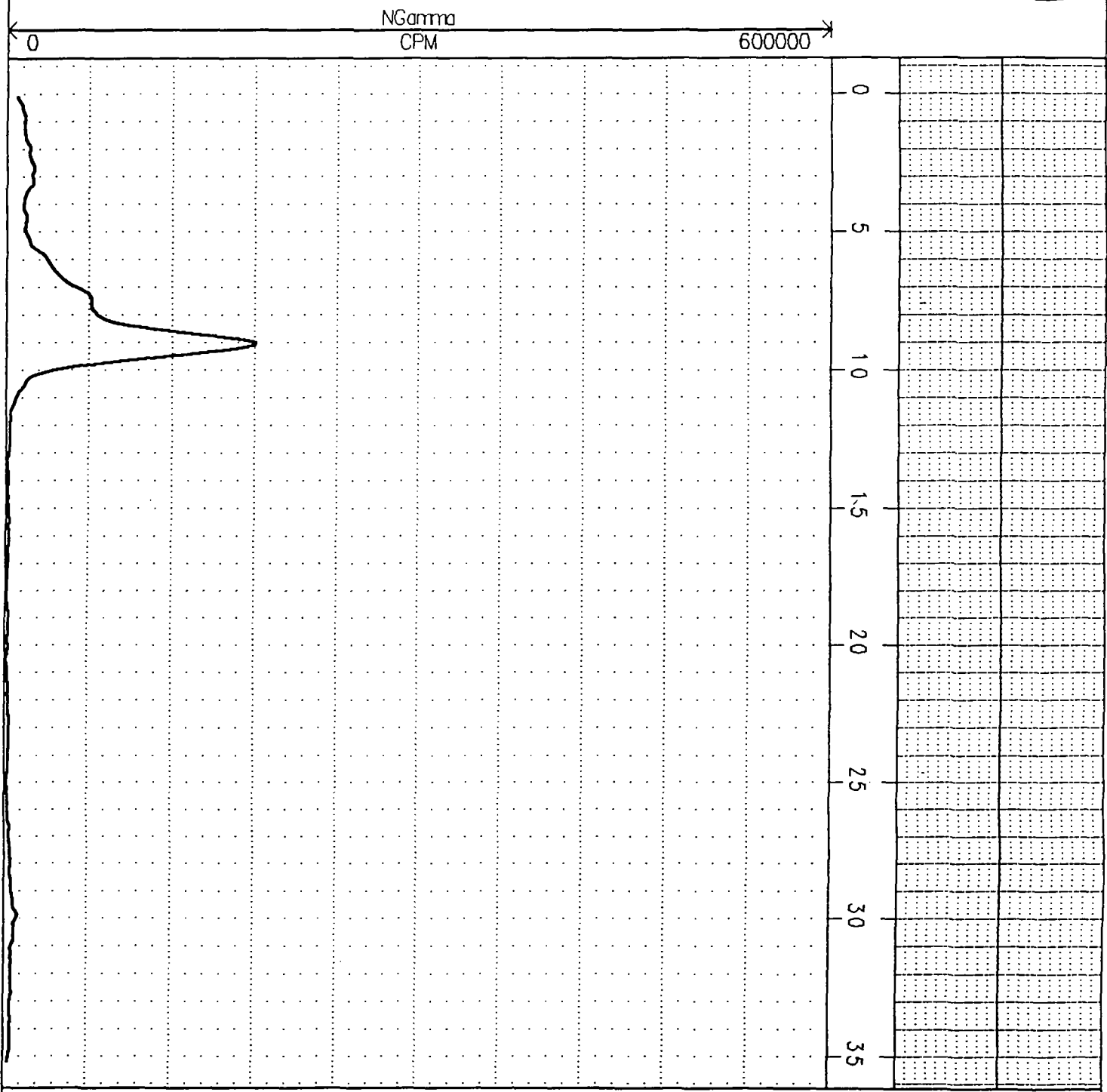
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COLOG



(C:\WESTLAKE\WL105.GB4)

COLOG

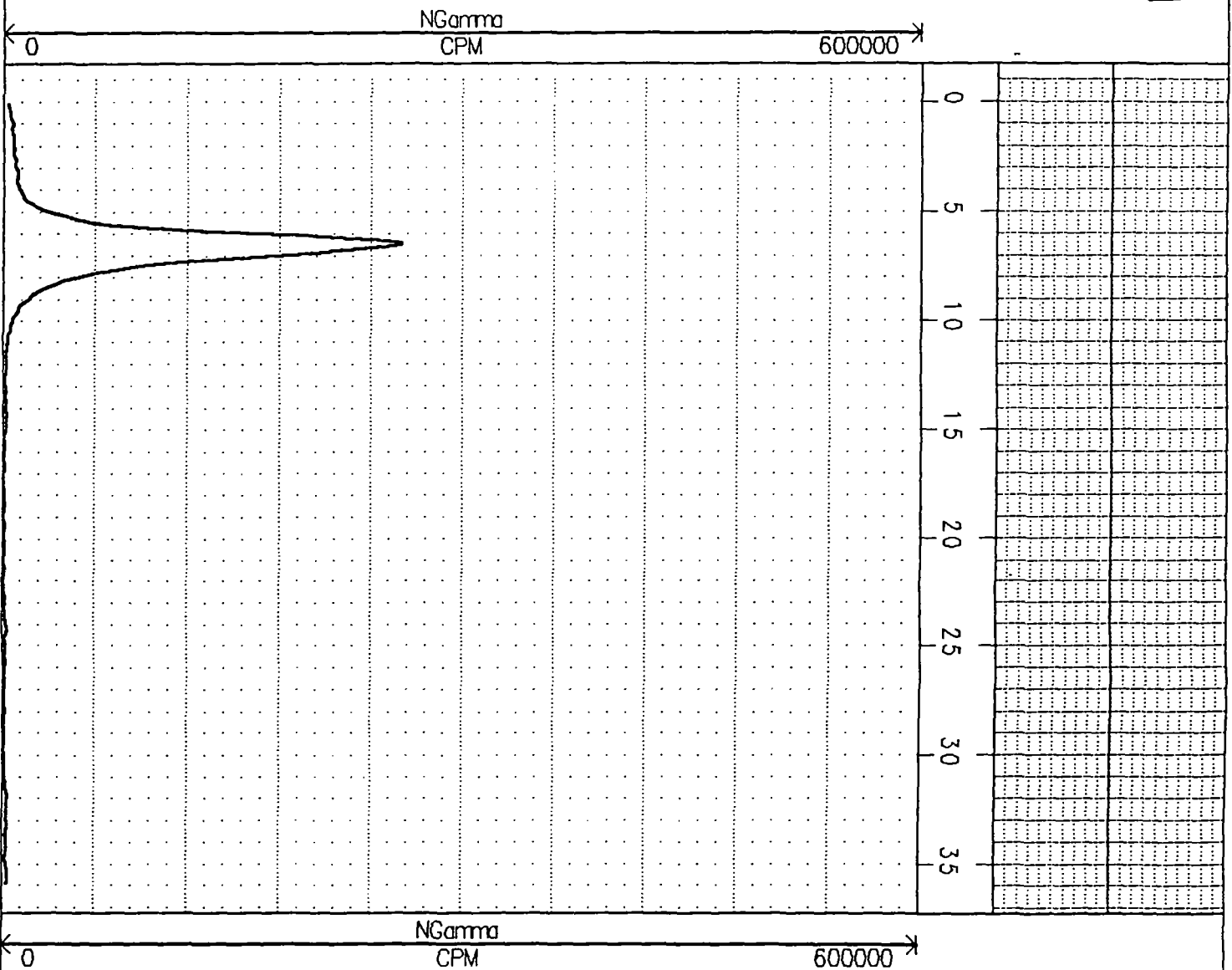


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COLOG

(C:\WESTLAKE\WLI4.GB0)

COLOG



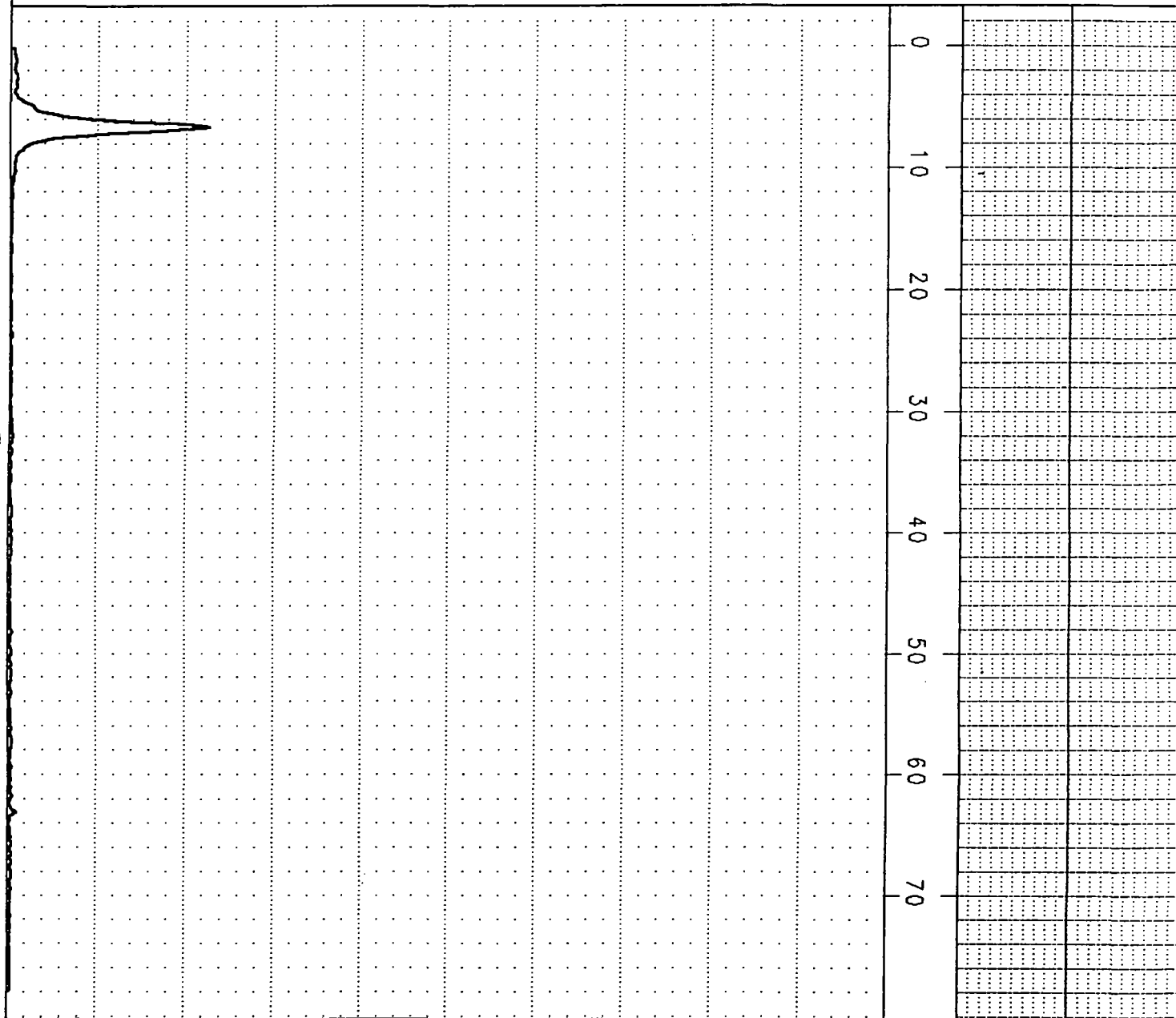
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COLOG

(C:\WESTLAKE\WLI4D.GB0)

COLOG

← 0 NGamma CPM 600000 →



← 0 NGamma CPM 600000 →

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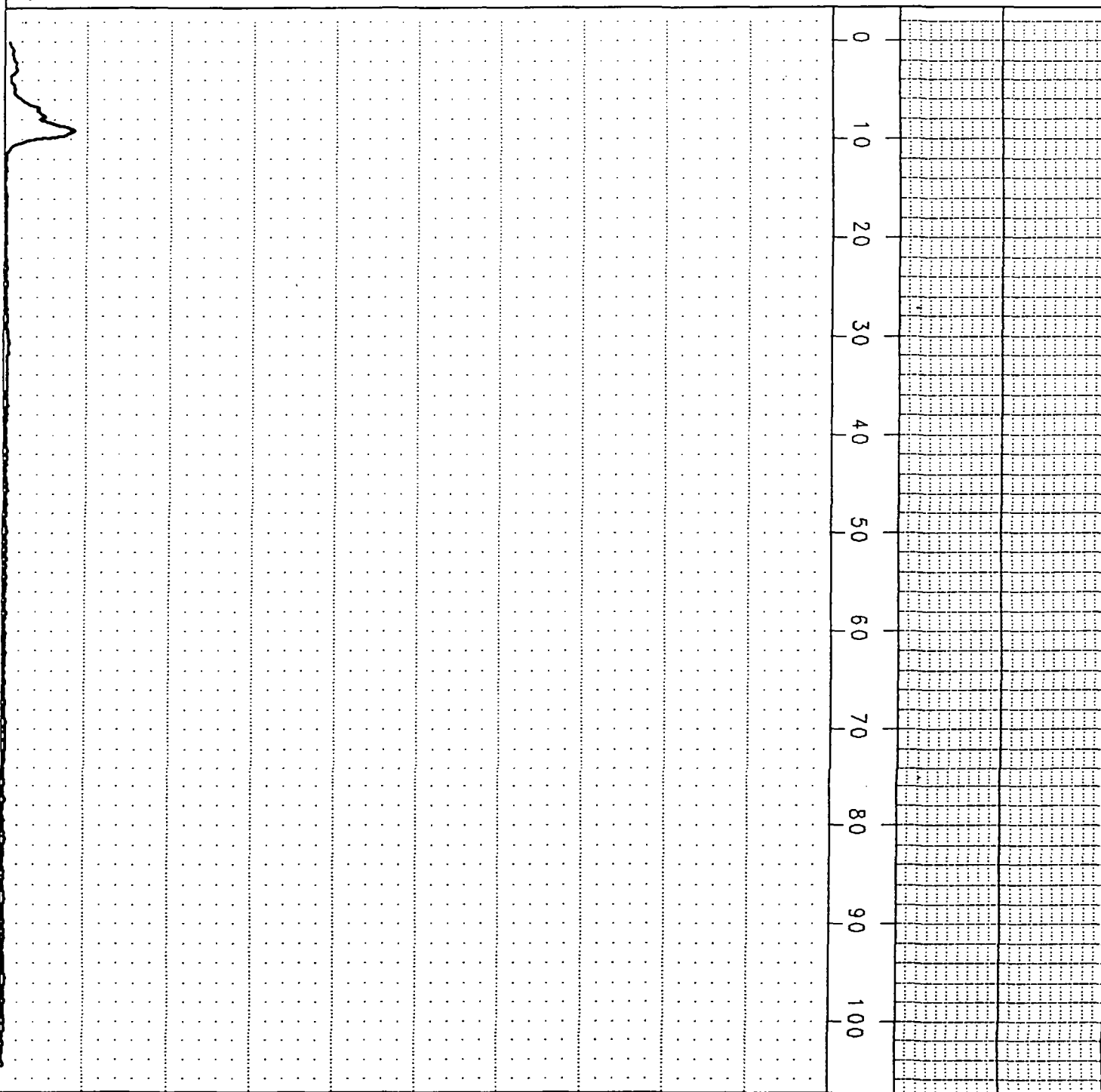
COLOG

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COLOG

NGamma
CPM

600000



NGamma
CPM

600000

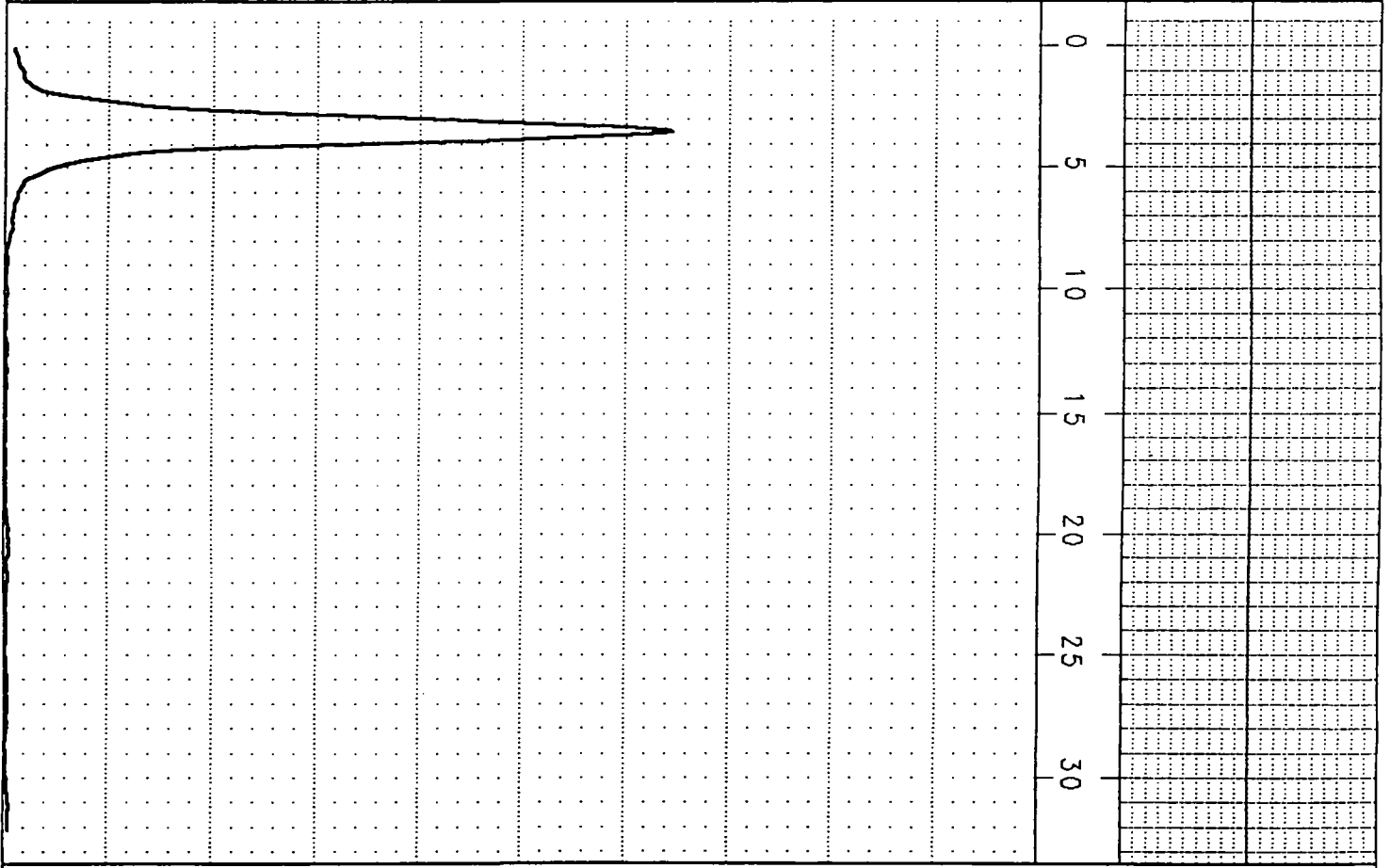
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COLOG

(C:\WESTLAKE\WLS5.GB0)

COLOG

0 NGamma CPM 600000



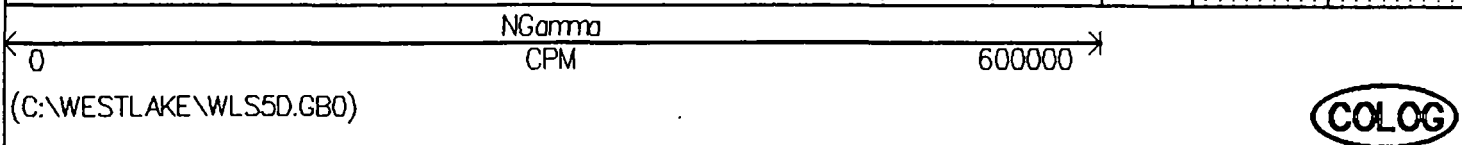
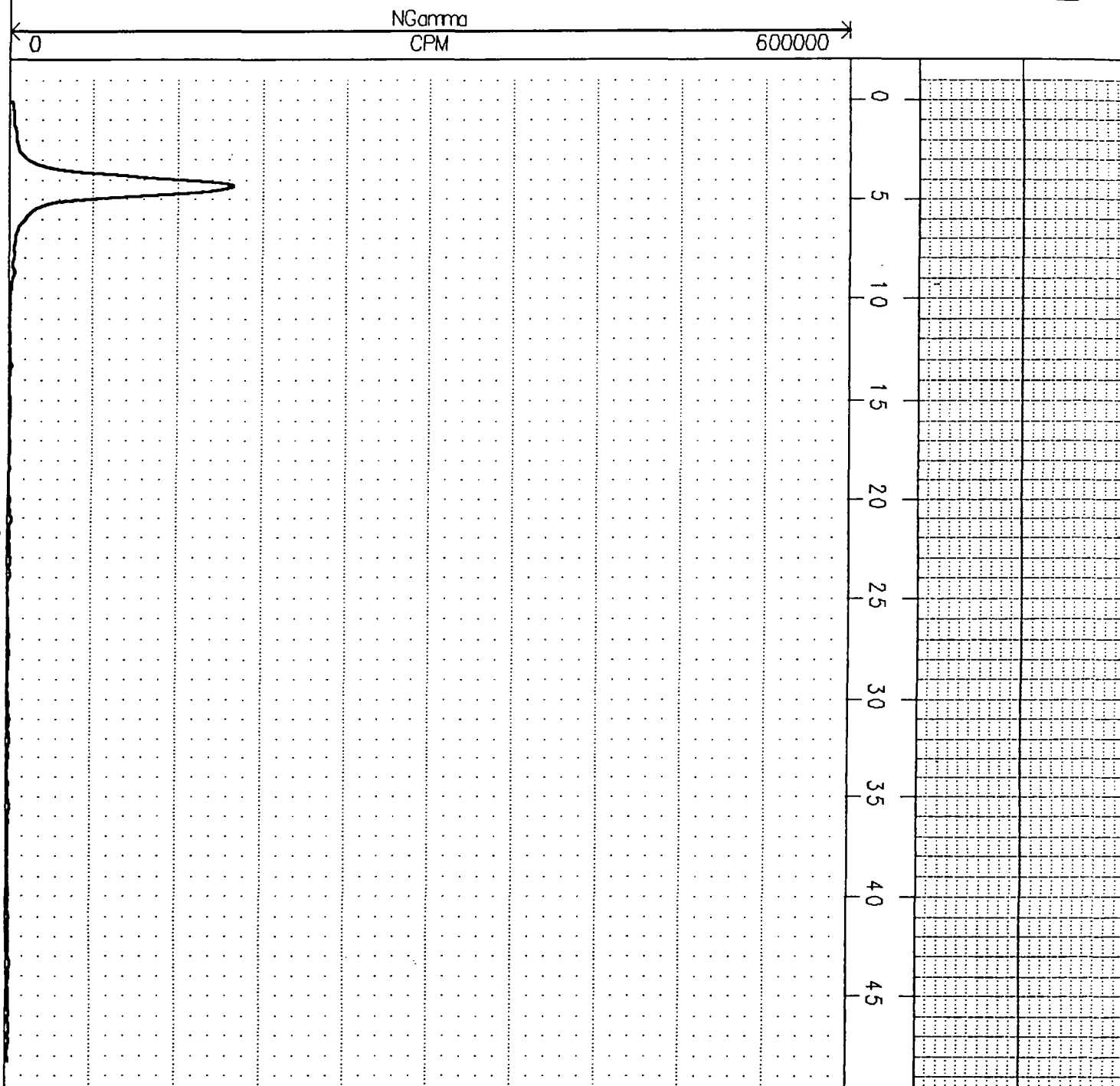
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COLOG

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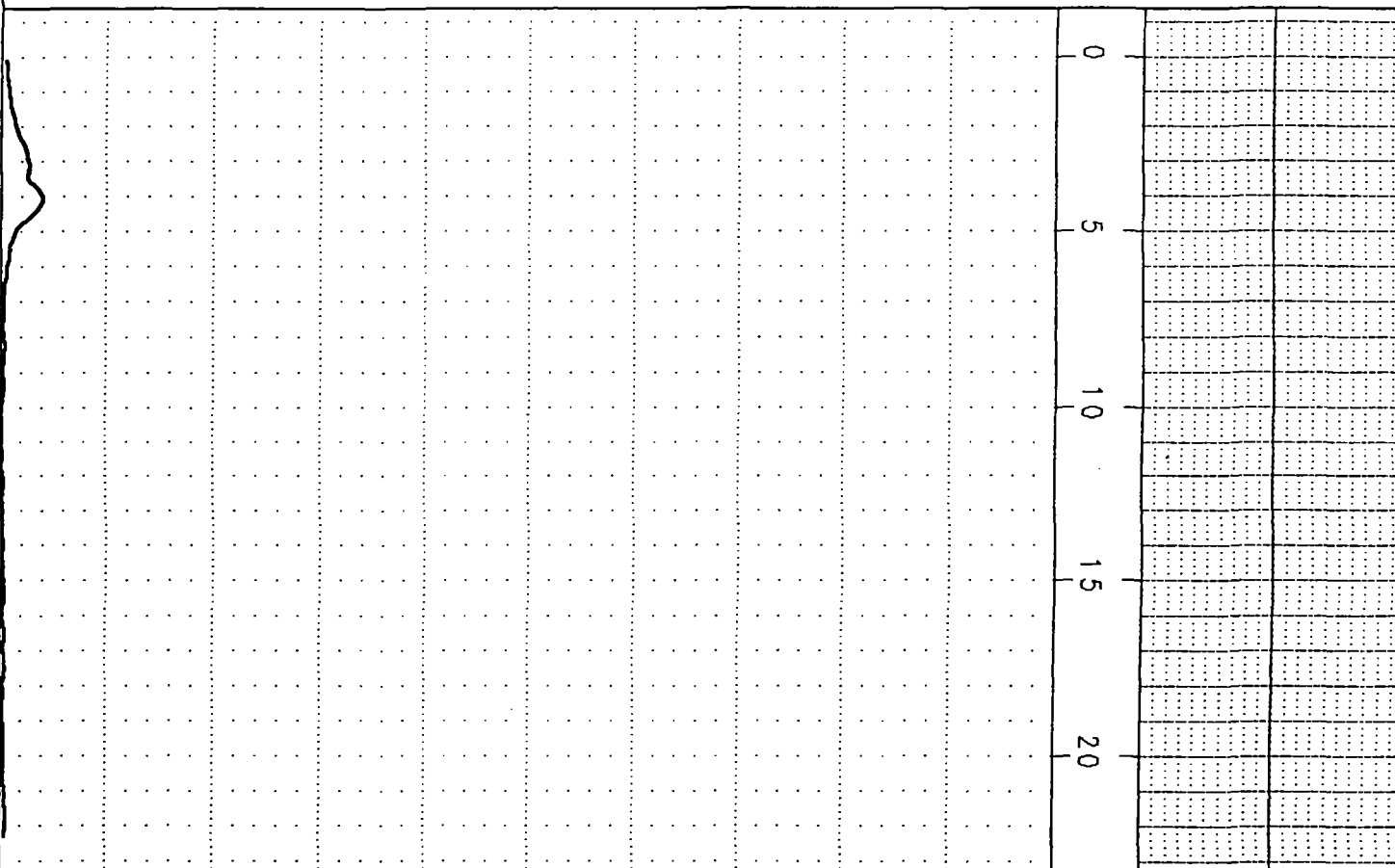
COLOG



(C:\WESTLAKE\WL106.GB0)

COLOG

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← 0 NGamma CPM 600000 →

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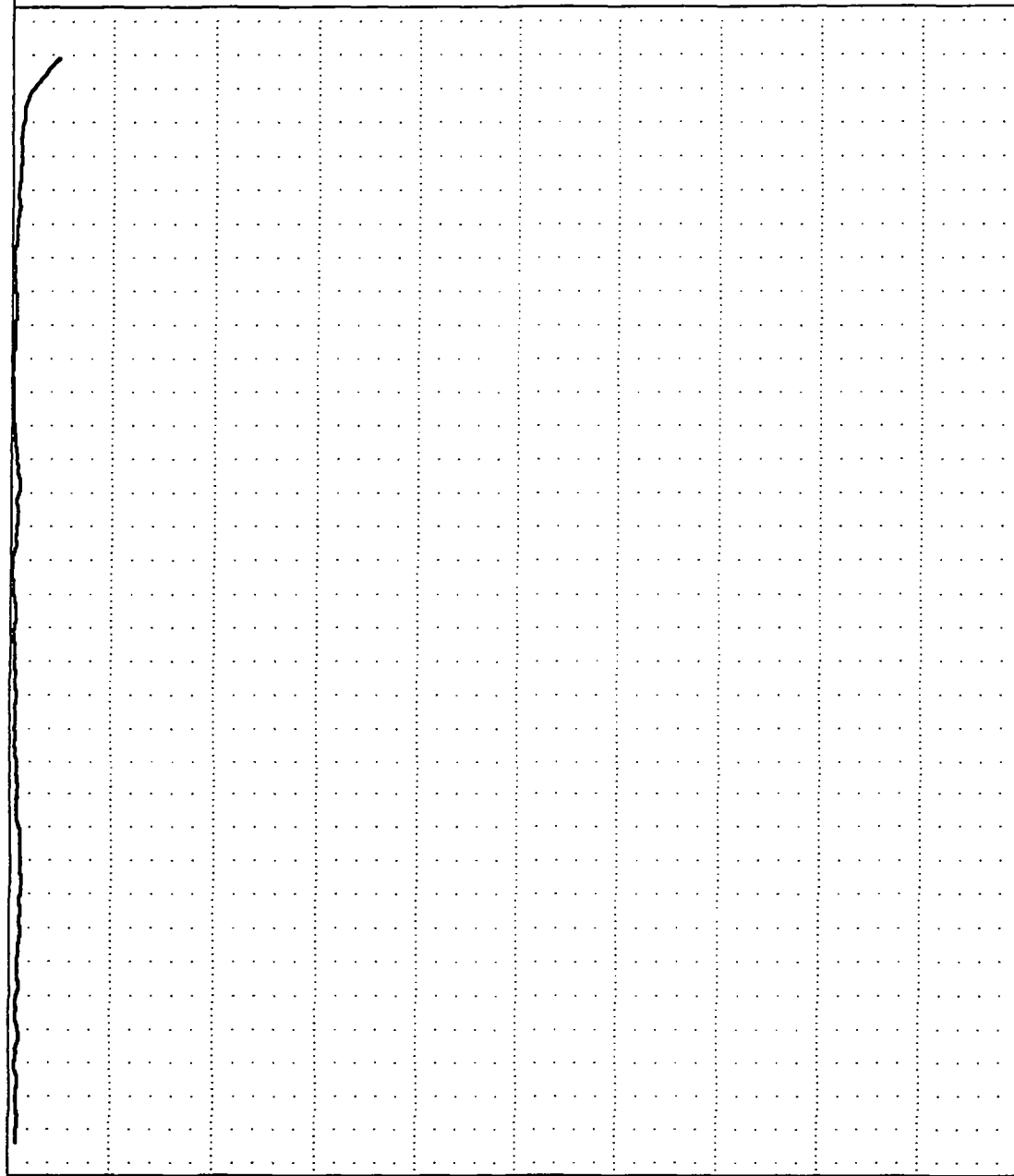
COLOG

(C:\WESTLAKE\WL106A.GB0)

COLOG

0 NGamma CPM 600000

0
5
10
15
20
25
30



0 NGamma CPM 600000

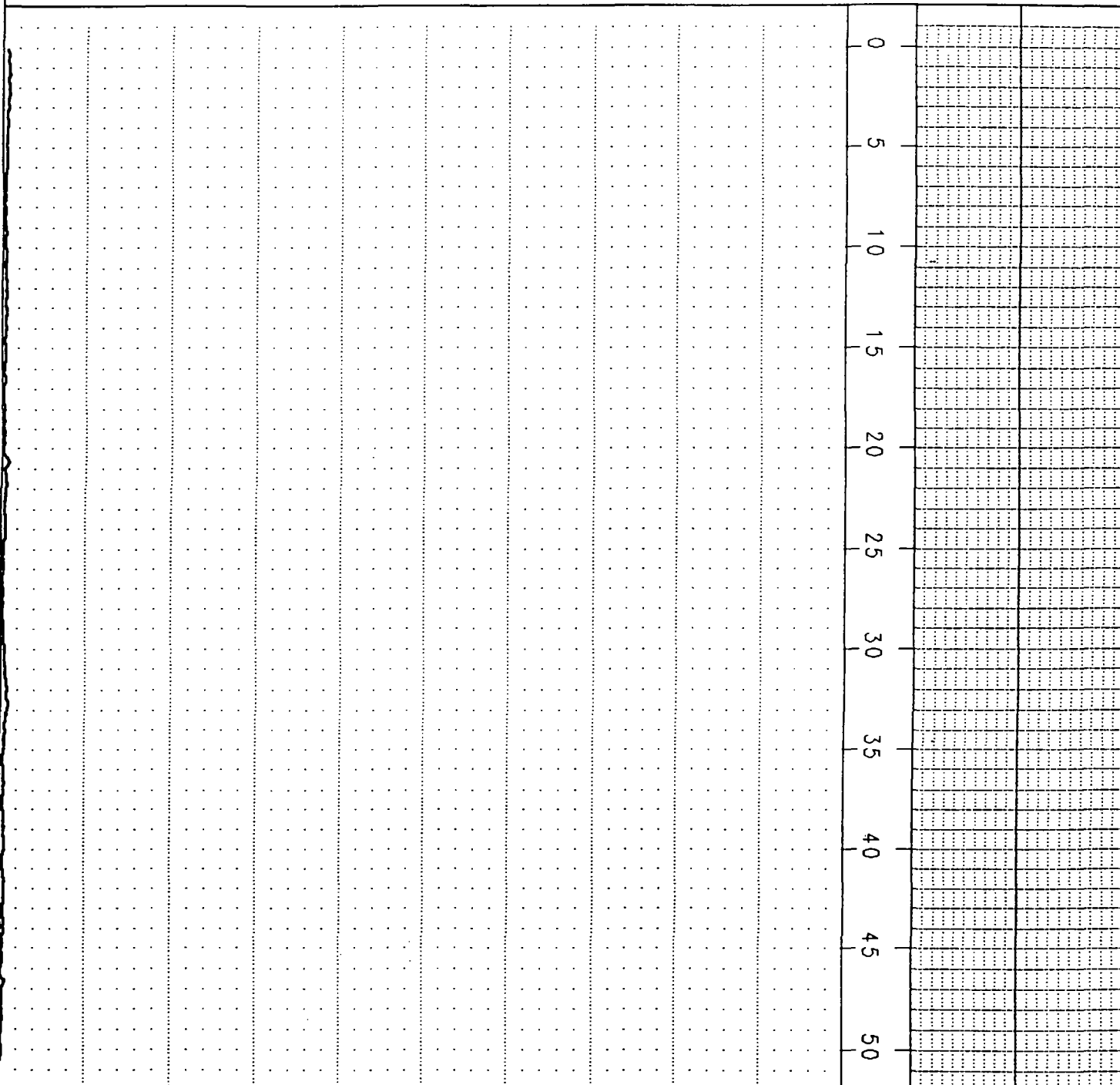
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COLOG

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COLOG

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← 0 NGamma CPM 600000 →

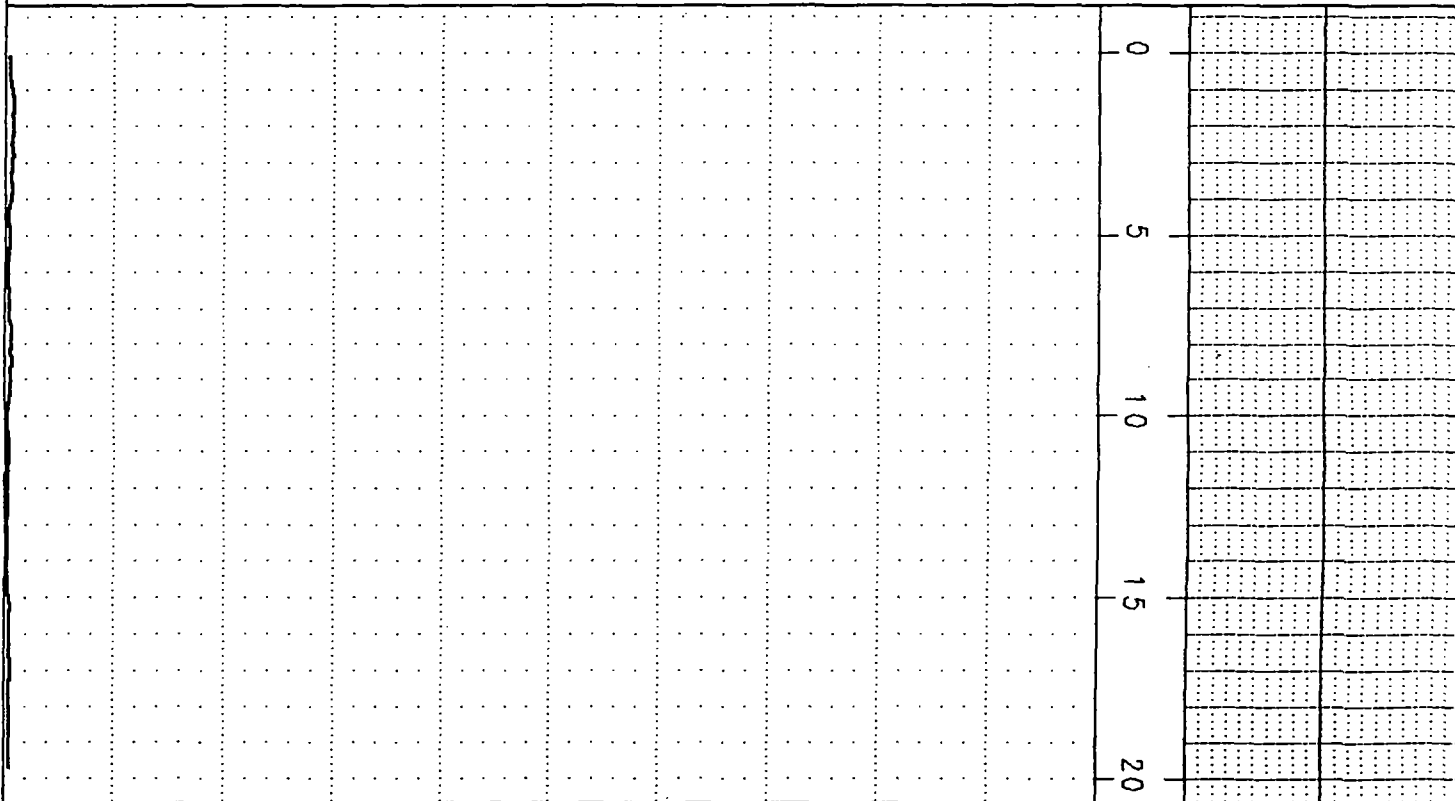
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COLOG

(C:\WESTLAKE\WL108.GB0)

COLOG

0 NGamma CPM 600000



0 NGamma CPM 600000

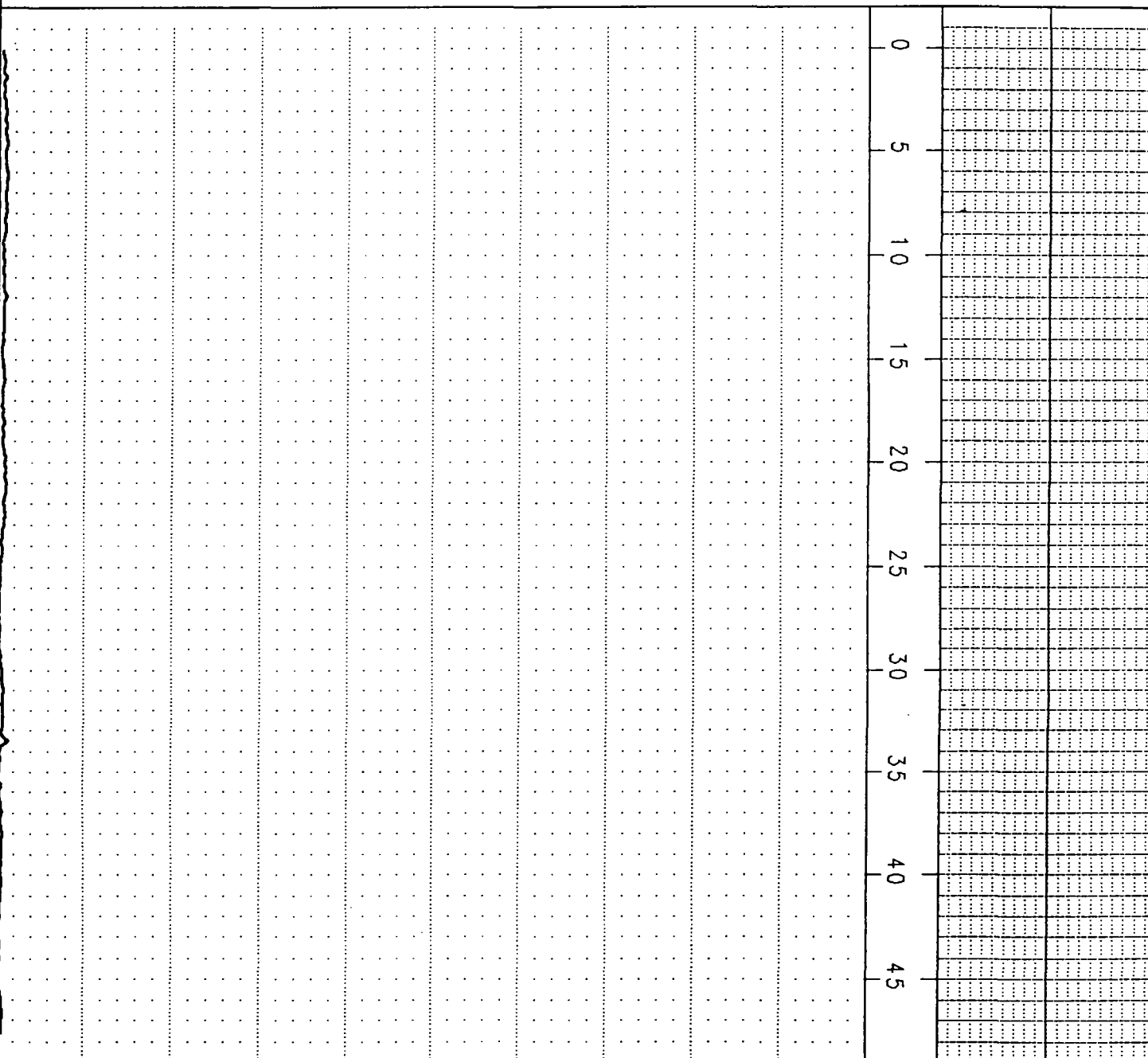
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COLOG

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COLOG

0 NGamma CPM 600000



0 NGamma CPM 600000

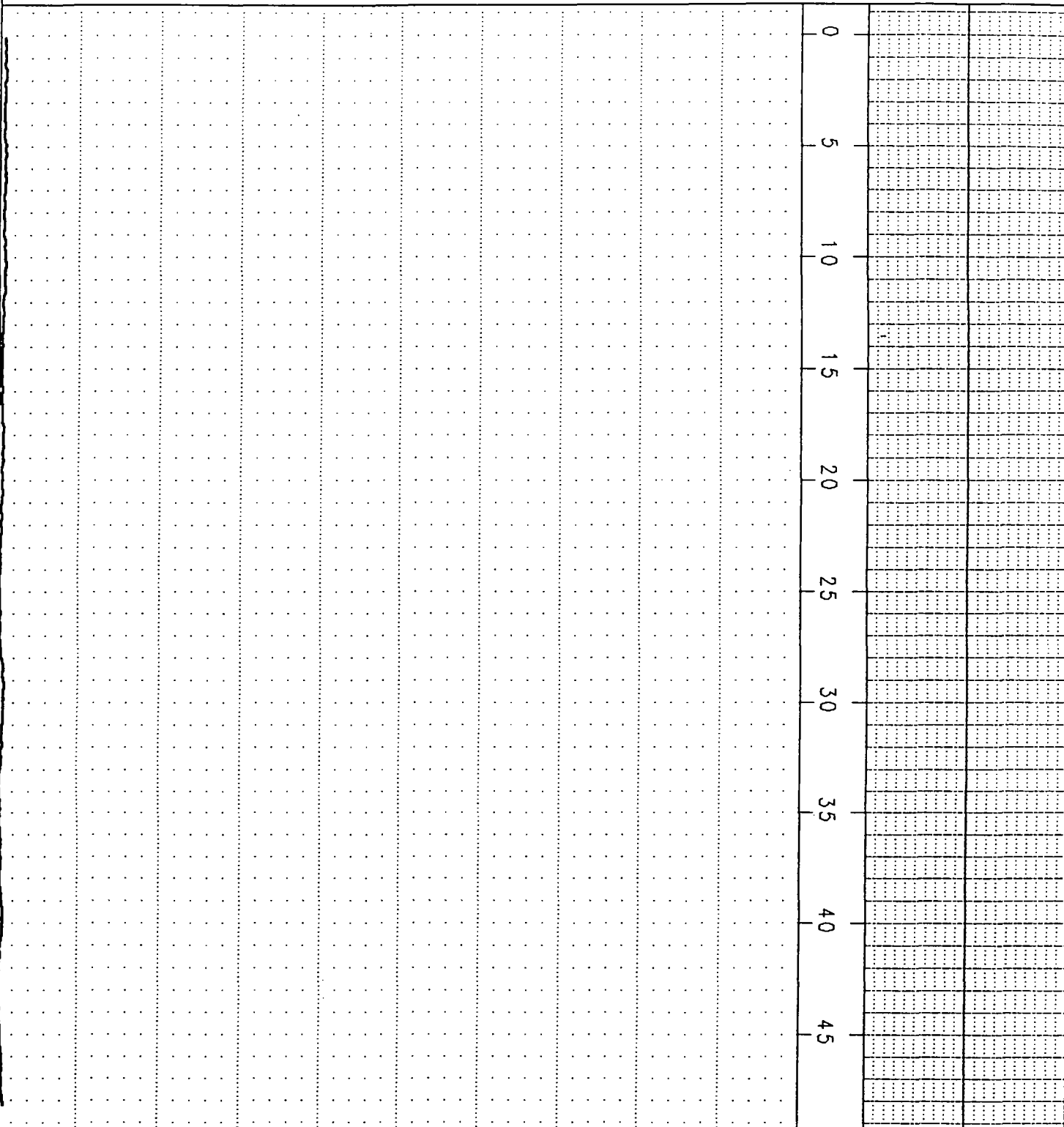
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COLOG

(C:\WESTLAKE\WL109B.GB0)

COLOG

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← 0 NGamma CPM 600000 →

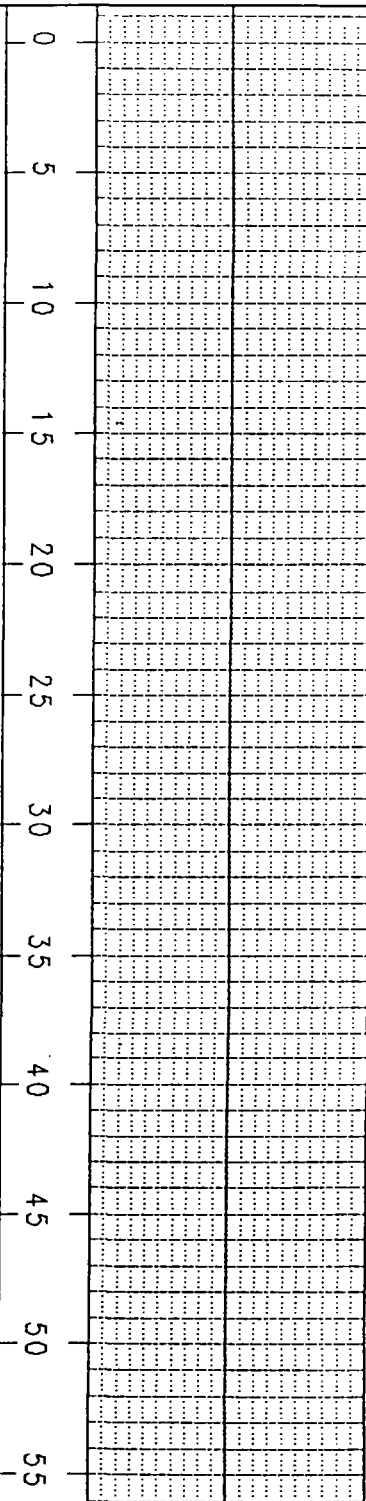
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COLOG

(C:\WESTLAKE\WL109C.GB0)

COLOG

← 0 NGamma CPM 600000 →



← 0 NGamma CPM 600000 →

(C:\WESTLAKE\WL109C.GB0)

COLOG

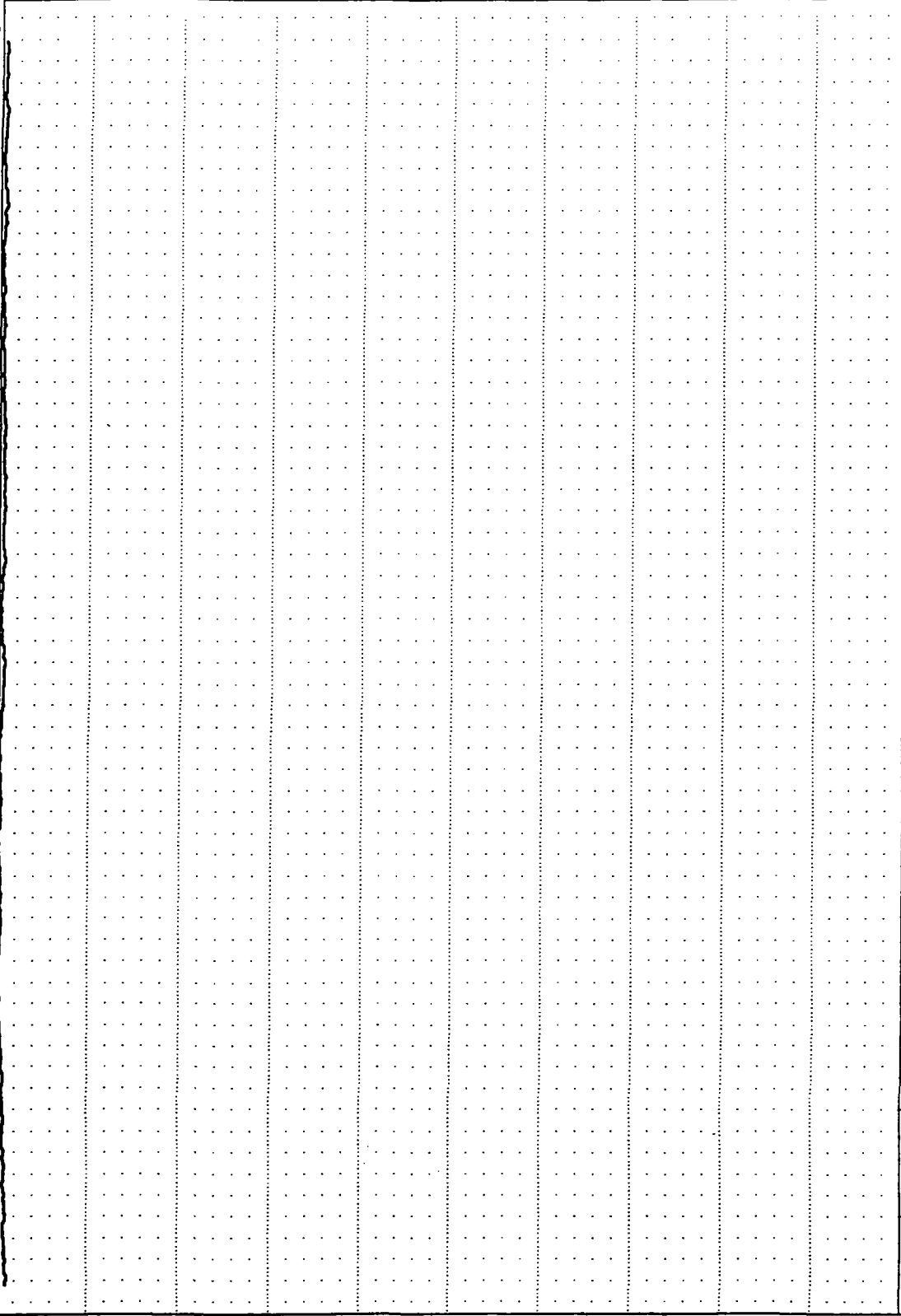
COLOG

(C:\WESTLAKE\WL109D.GB0)

NGamma
CPM

600000

0



0

NGamma
CPM

600000

(C:\WESTLAKE\WL109D.GB0)

COLOG

(C:\WESTLAKE\WL110.GB0)

COLOG

NGamma
CPM

0

600000

0
5
10
15
20
25
30
35
40
45
50

NGamma
CPM

0

600000

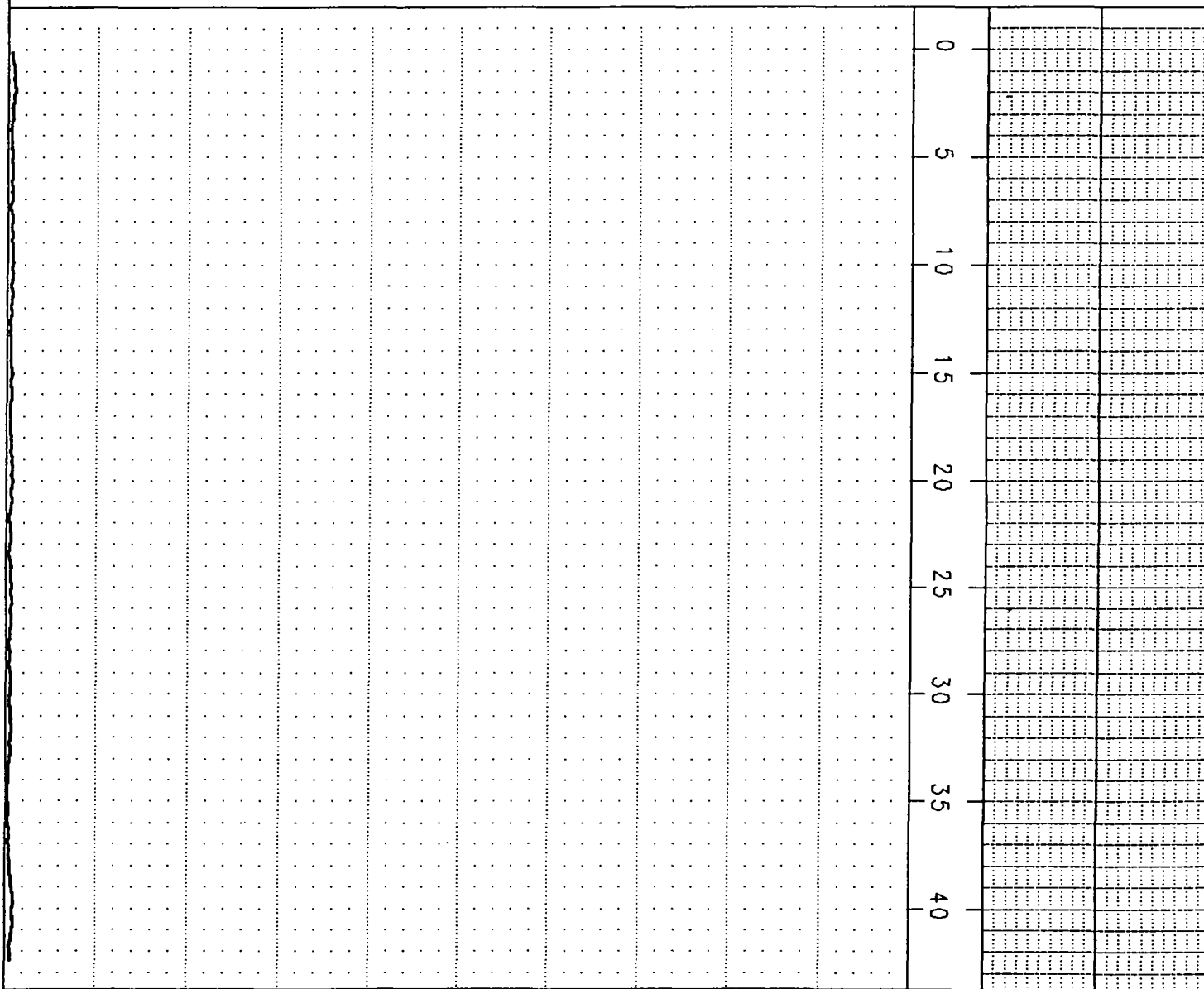
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COLOG

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COLOG

0 NGamma CPM 600000



0 NGamma CPM 600000

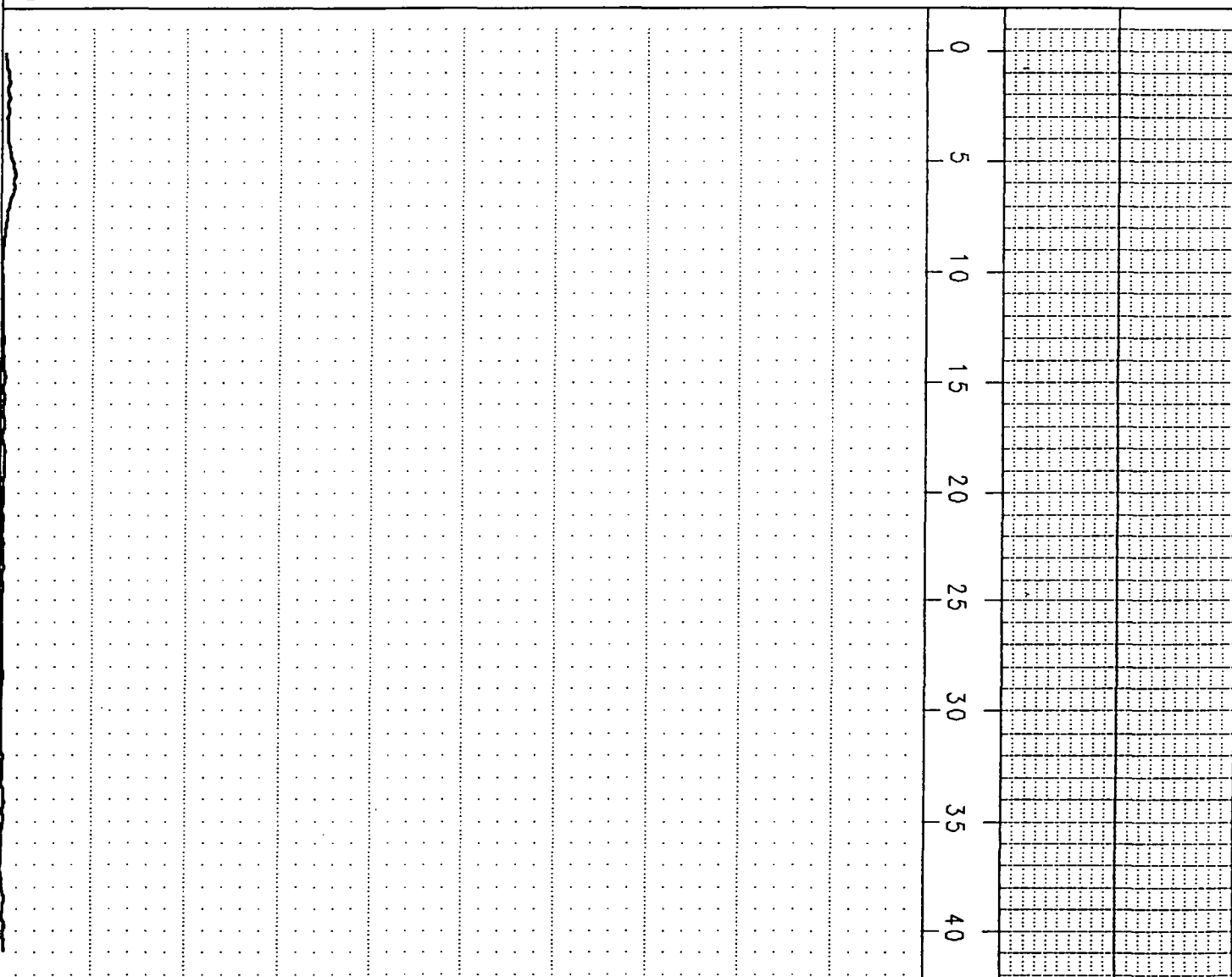
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COLOG

(C:\WESTLAKE\WL112.GB1)

COLOG

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← 0 NGamma CPM 600000 →

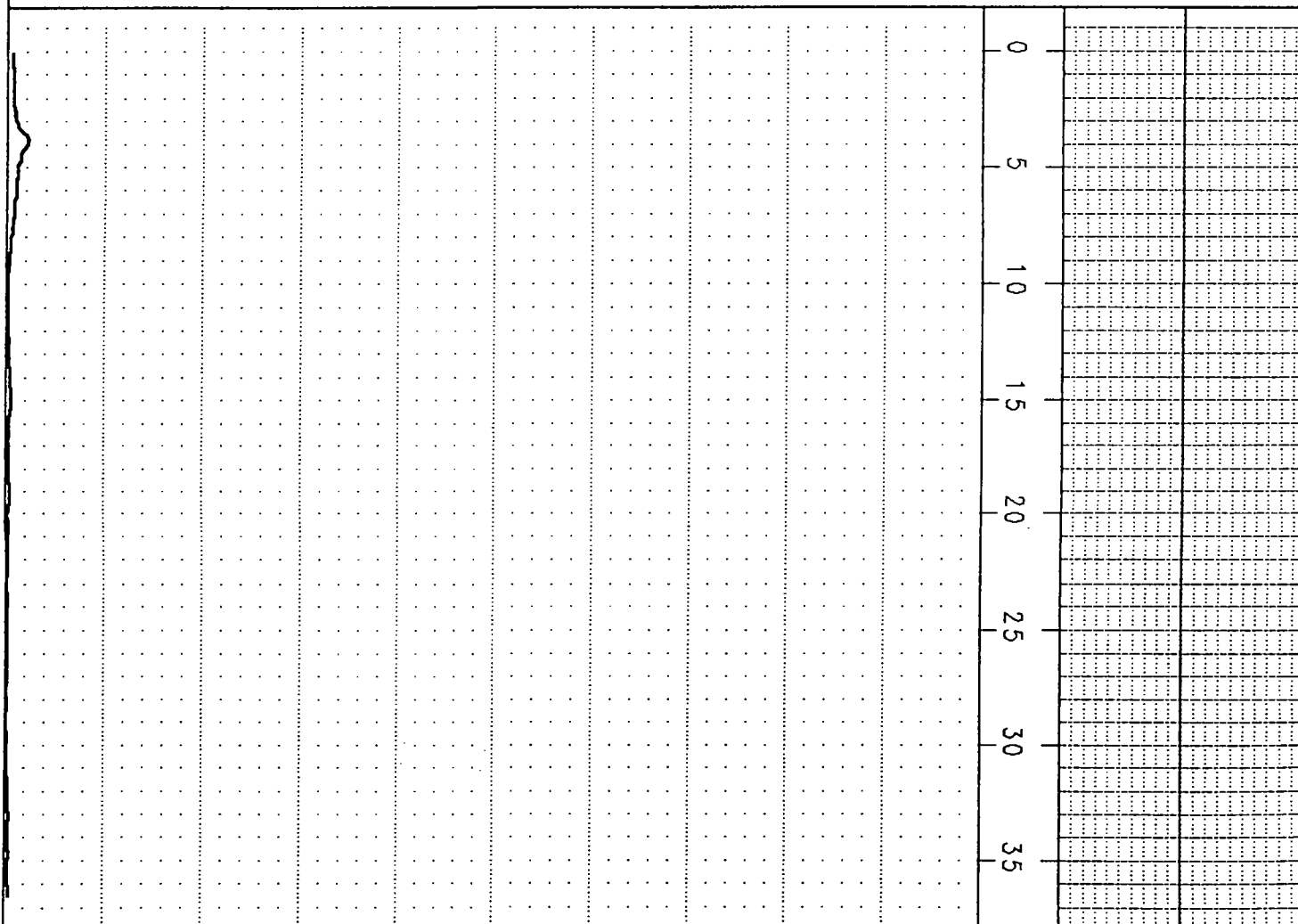
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COLOG

(C:\WESTLAKE\WL113.GB0)

COLOG

NGamma
CPM 0 600000



NGamma
CPM 0 600000

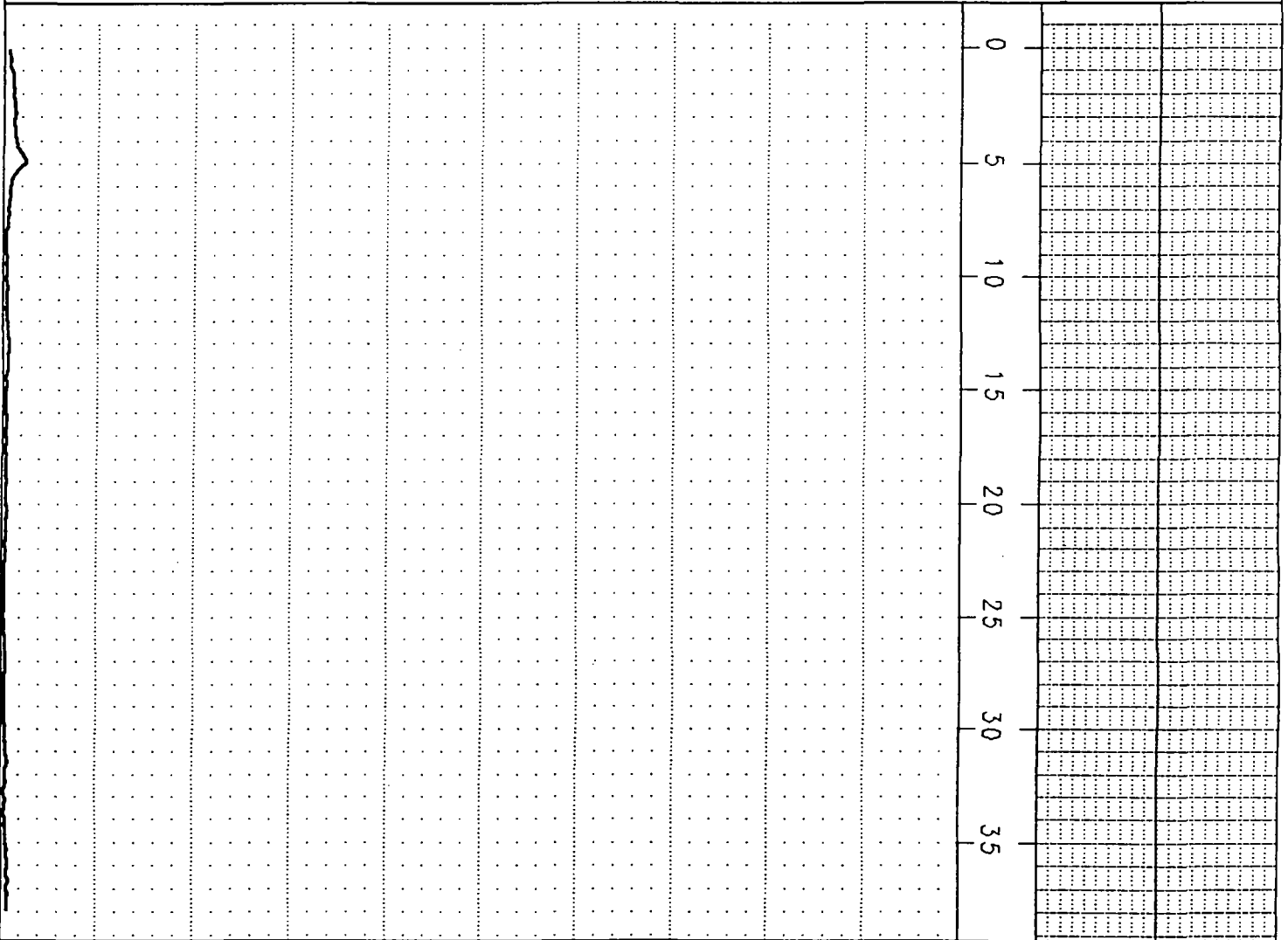
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COLOG

(C:\WESTLAKE\WL114.GB0)

COLOG

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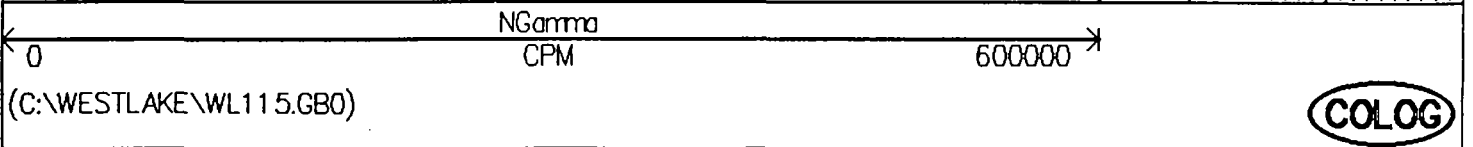
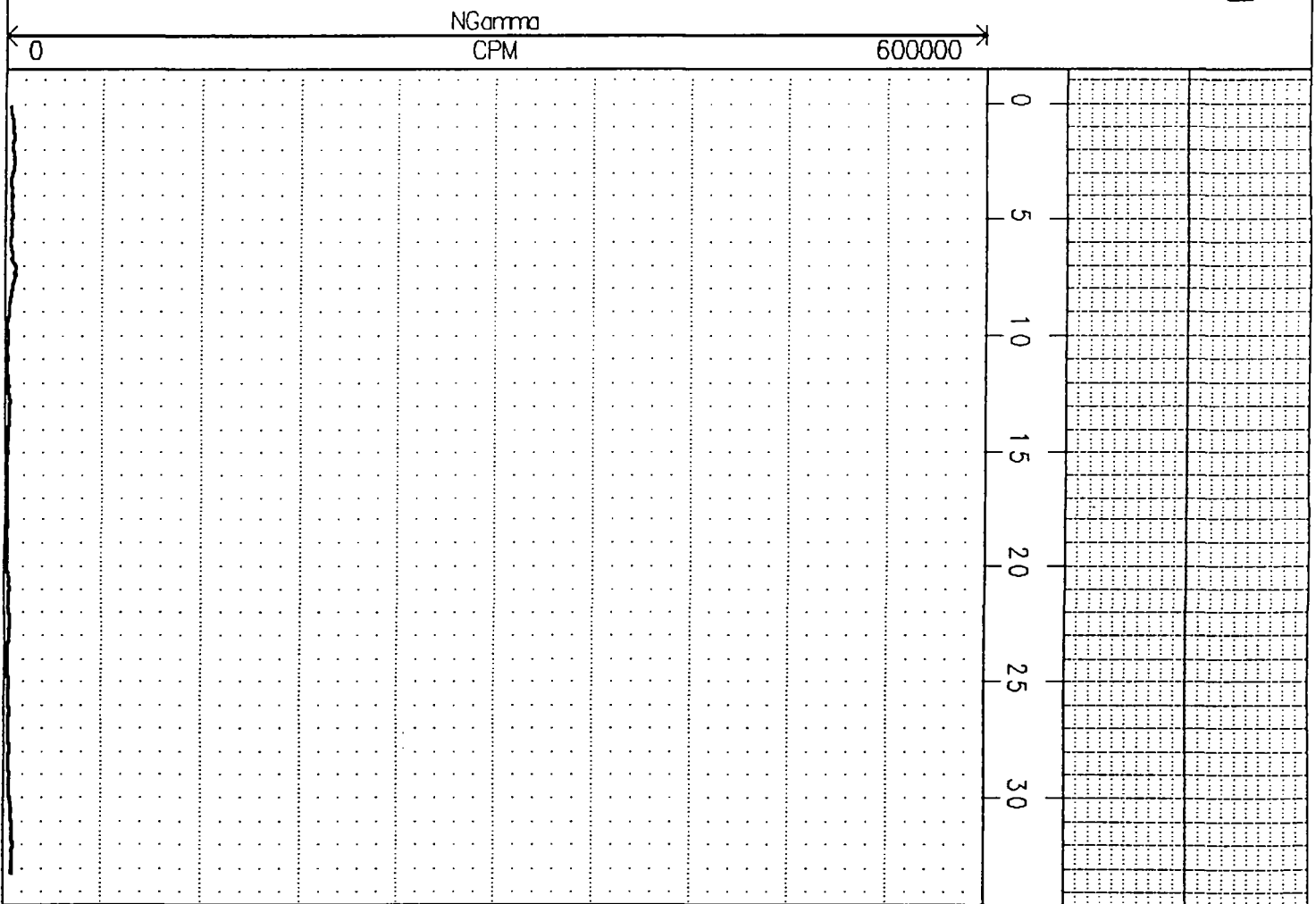
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COLOG

(C:\WESTLAKE\WL115.GB0)

COLOG



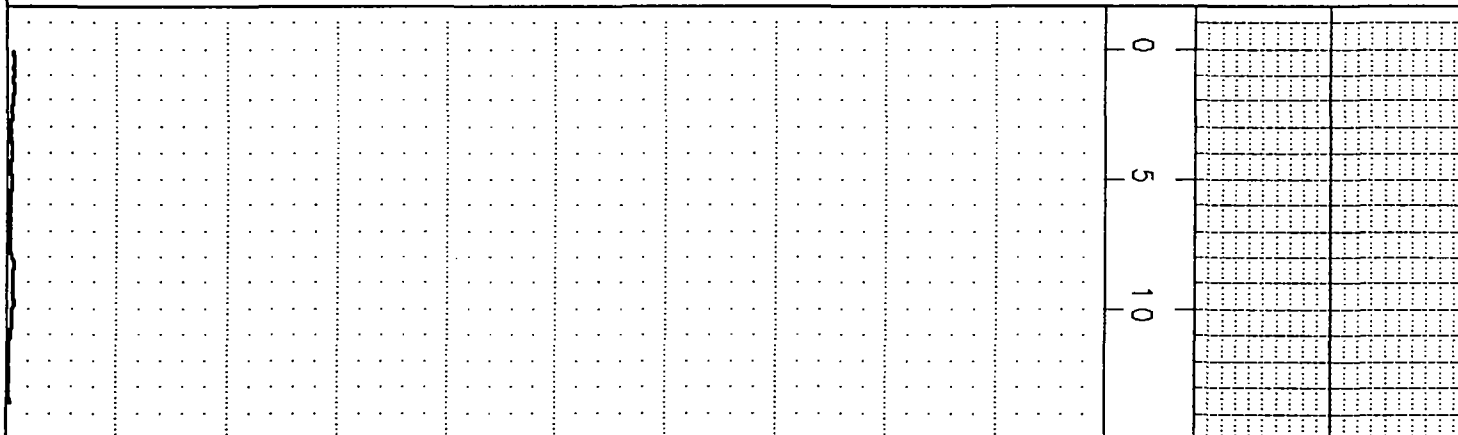
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COLOG

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COLOG

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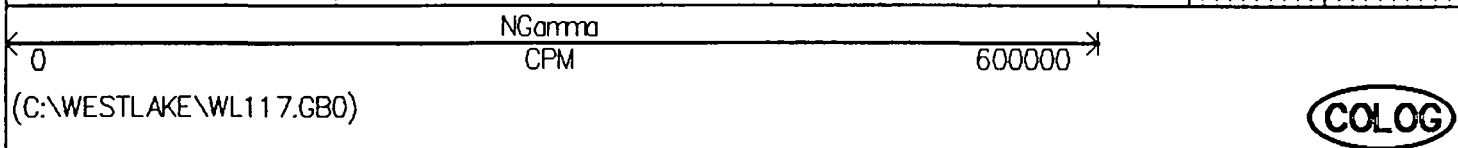
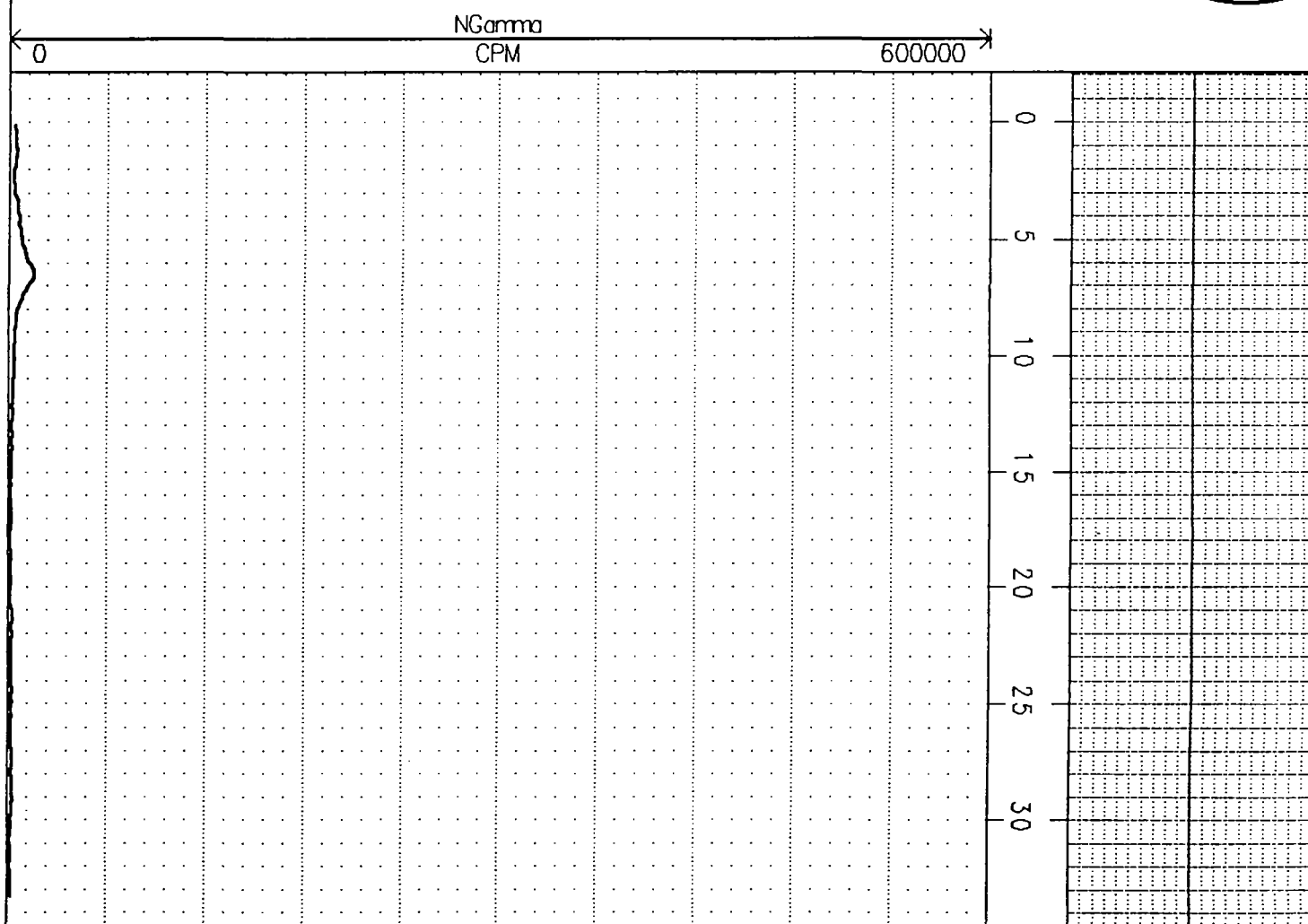
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(C:\WESTLAKE\WL116.GB0)

COLOG

(C:\WESTLAKE\WL117.GB0)

COLOG

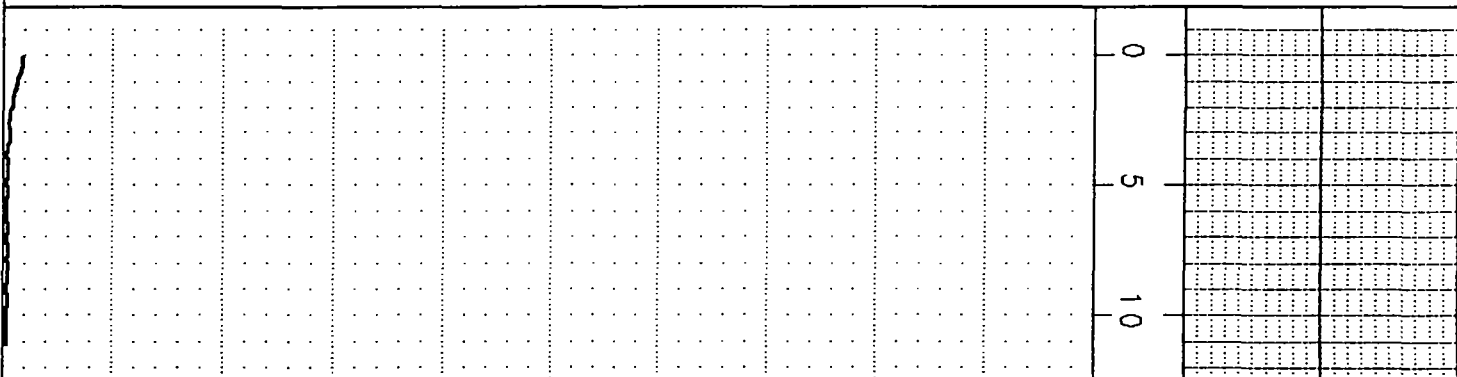


COLOG

(C:\WESTLAKE\WL118.GB0)

COLOG

← 0 NGamma CPM 600000 →



← 0 NGamma CPM 600000 →

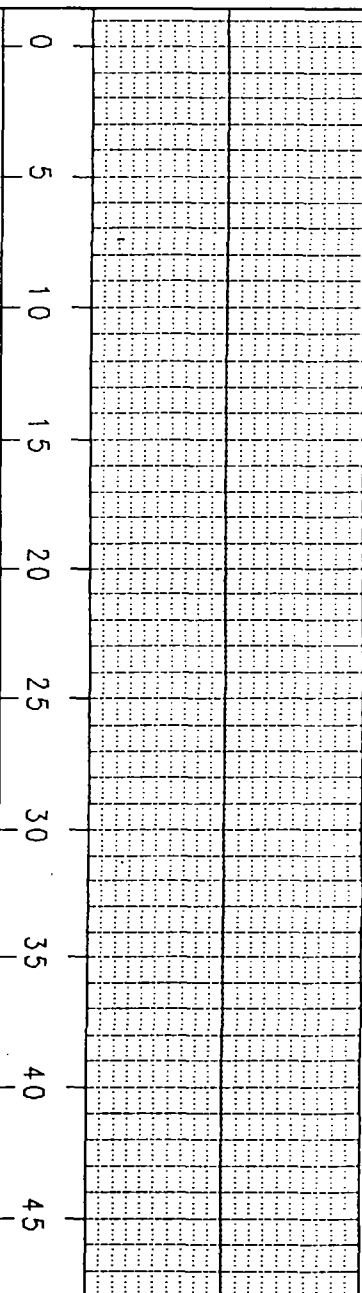
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COLOG

(C:\WESTLAKE\WL119.GB0)

COLOG

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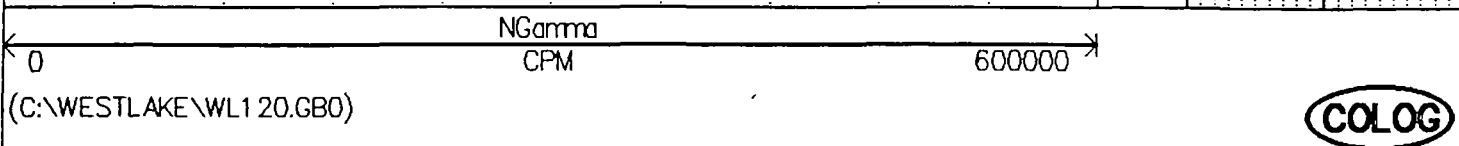
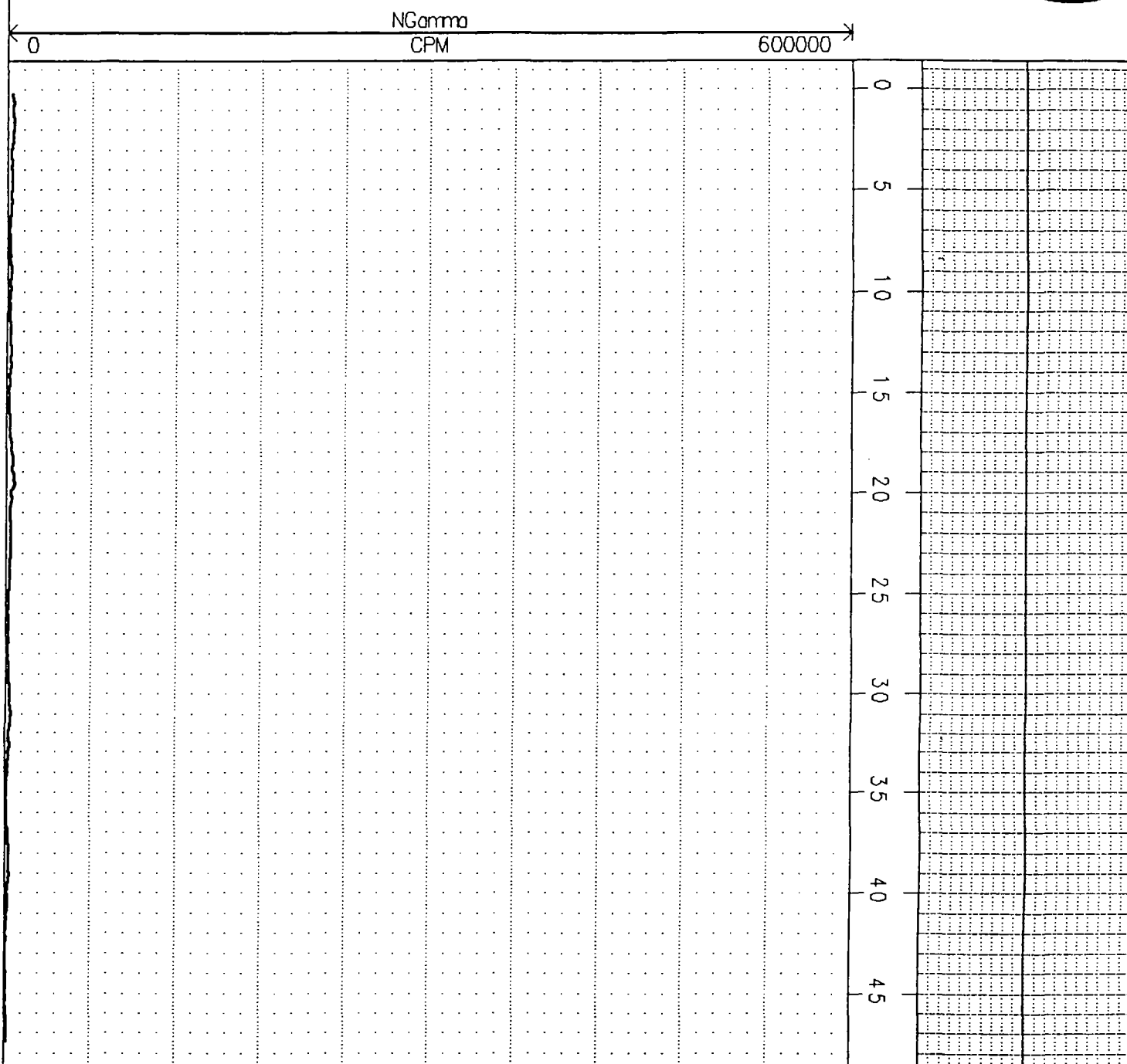
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(C:\WESTLAKE\WL119.GB0)

COLOG

(C:\WESTLAKE\WL1 20.GB0)

COLOG



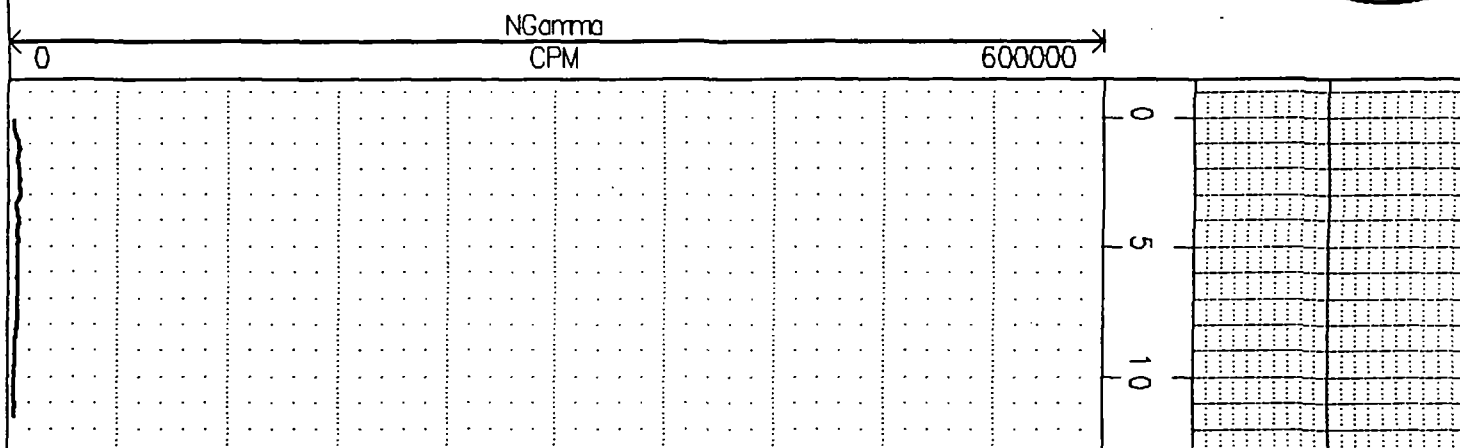
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COLOG

**Area 2 Soil Boring
Downhole Gamma Logs**

(C:\WESTLAKE\WL201.GBO)

COLOG



← 0 NGamma CPM 600000 →

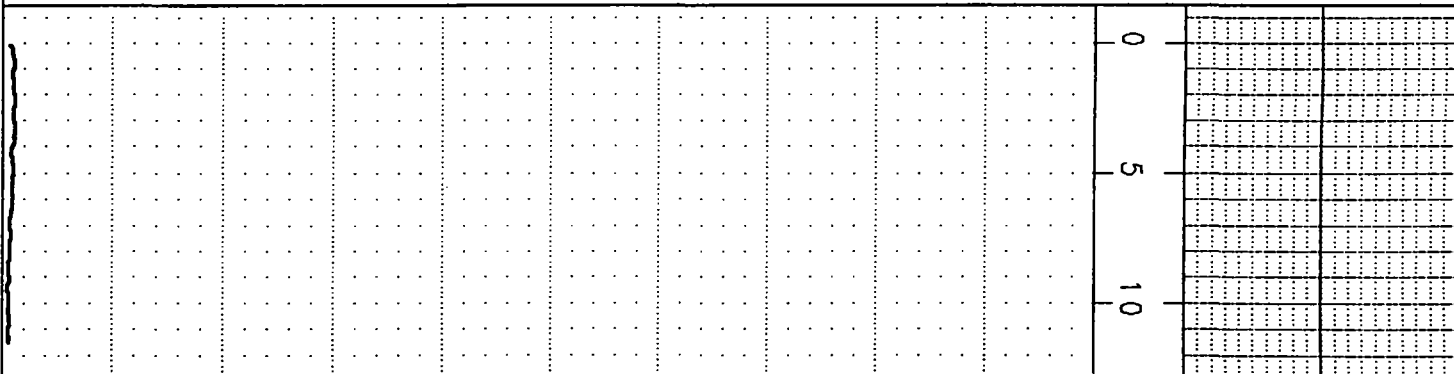
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COLOG

(C:\WESTLAKE\WL202.GB0)

COLOG

← 0 NGamma CPM 600000 →



← 0 NGamma CPM 600000 →

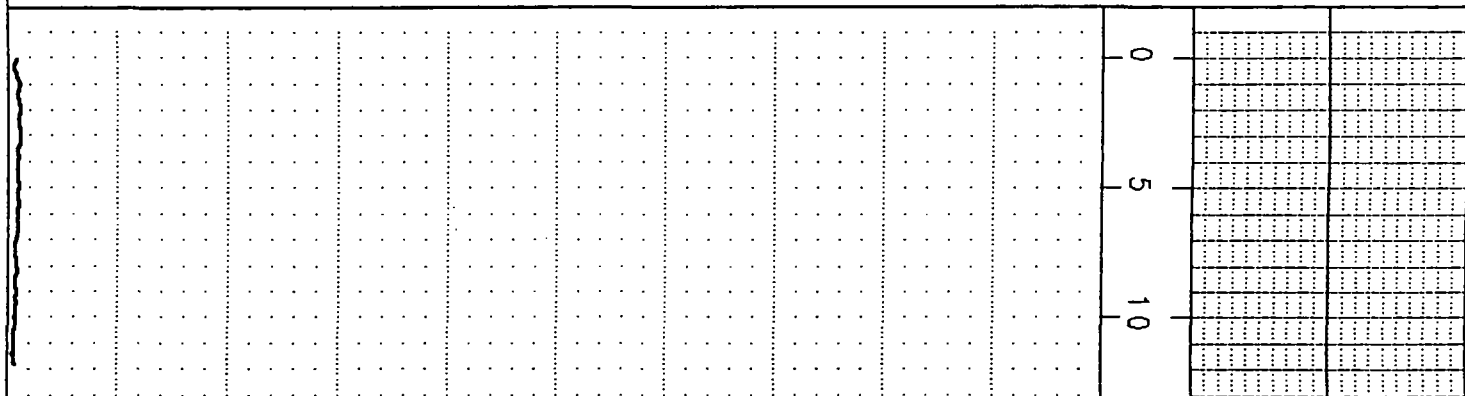
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COLOG

(C:\WESTLAKE\WL203.GB0)

COLOG

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← 0 NGamma CPM 600000 →

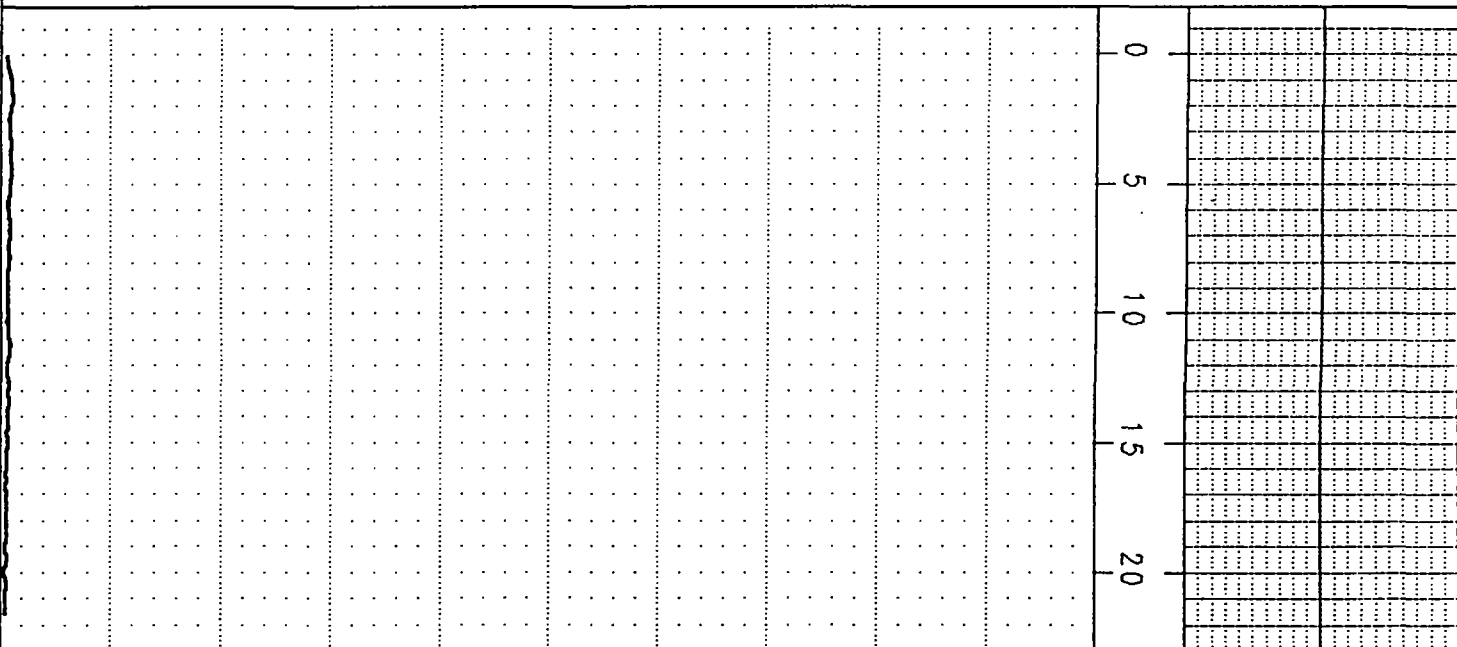
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COLOG

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COLOG

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← 0 NGamma CPM 600000 →

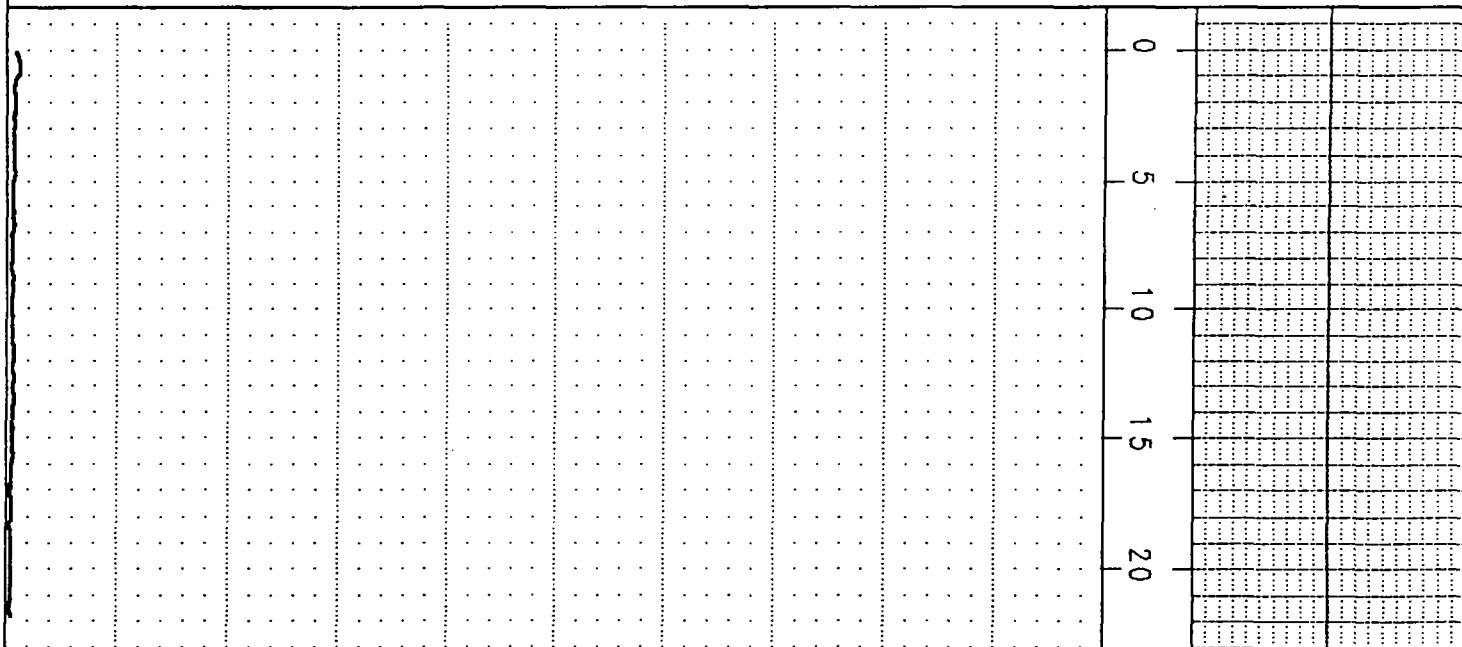
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COLOG

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COLOG

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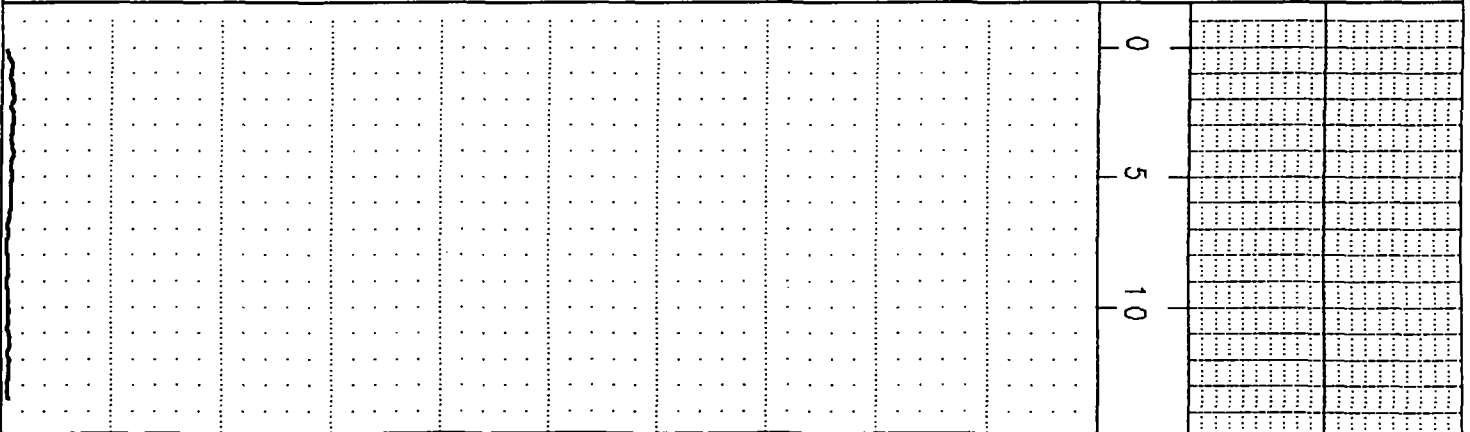
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COLOG

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COLOG

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← 0 NGamma CPM 600000 →

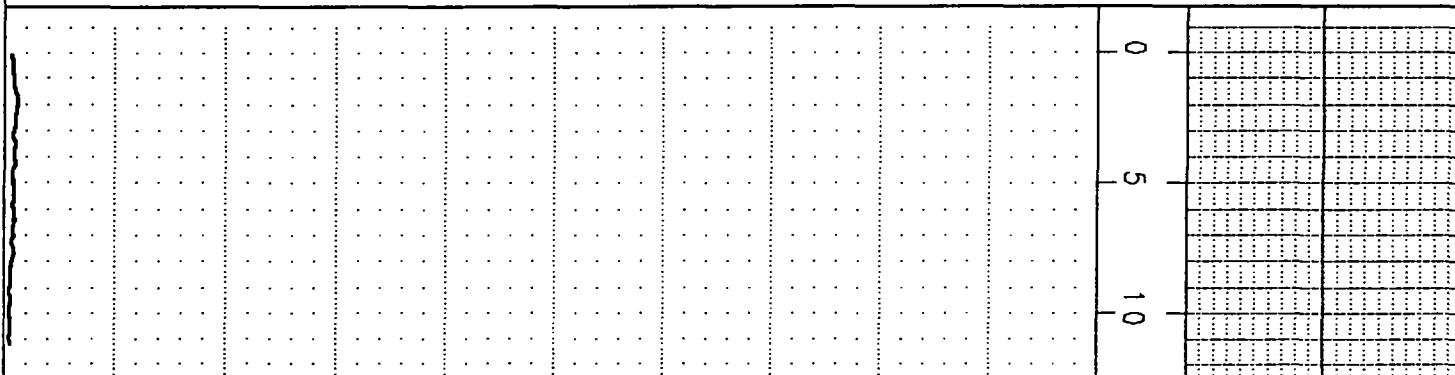
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COLOG

(C:\WESTLAKE\WLD6.GB0)

COLOG

← 0 NGamma CPM 600000 →



← 0 NGamma CPM 600000 →

(C:\WESTLAKE\WLD6.GB0)

COLOG

WZ 060

NGamma
CPM

600000

0
10
20
30
40
50
60
70
80
90
100

NGamma
CPM

600000

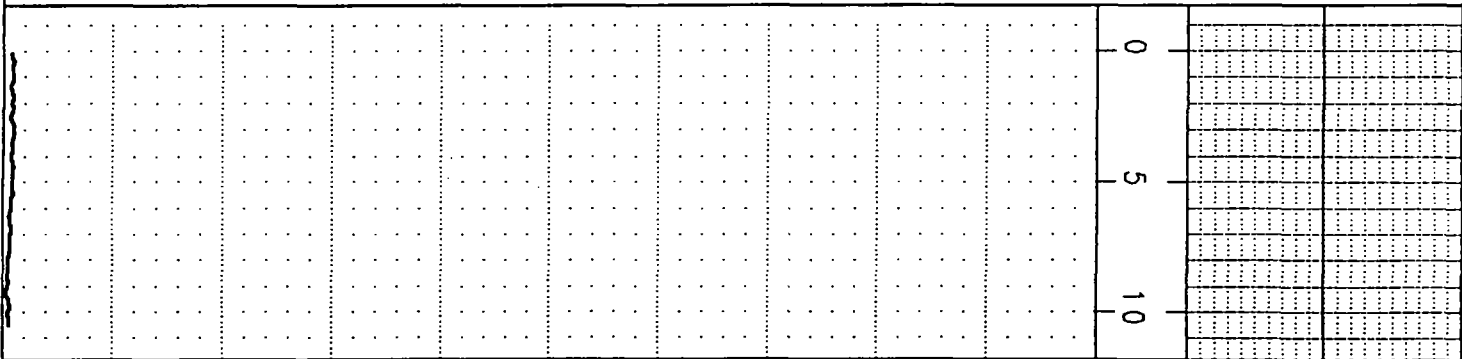
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COLOG

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COLOG

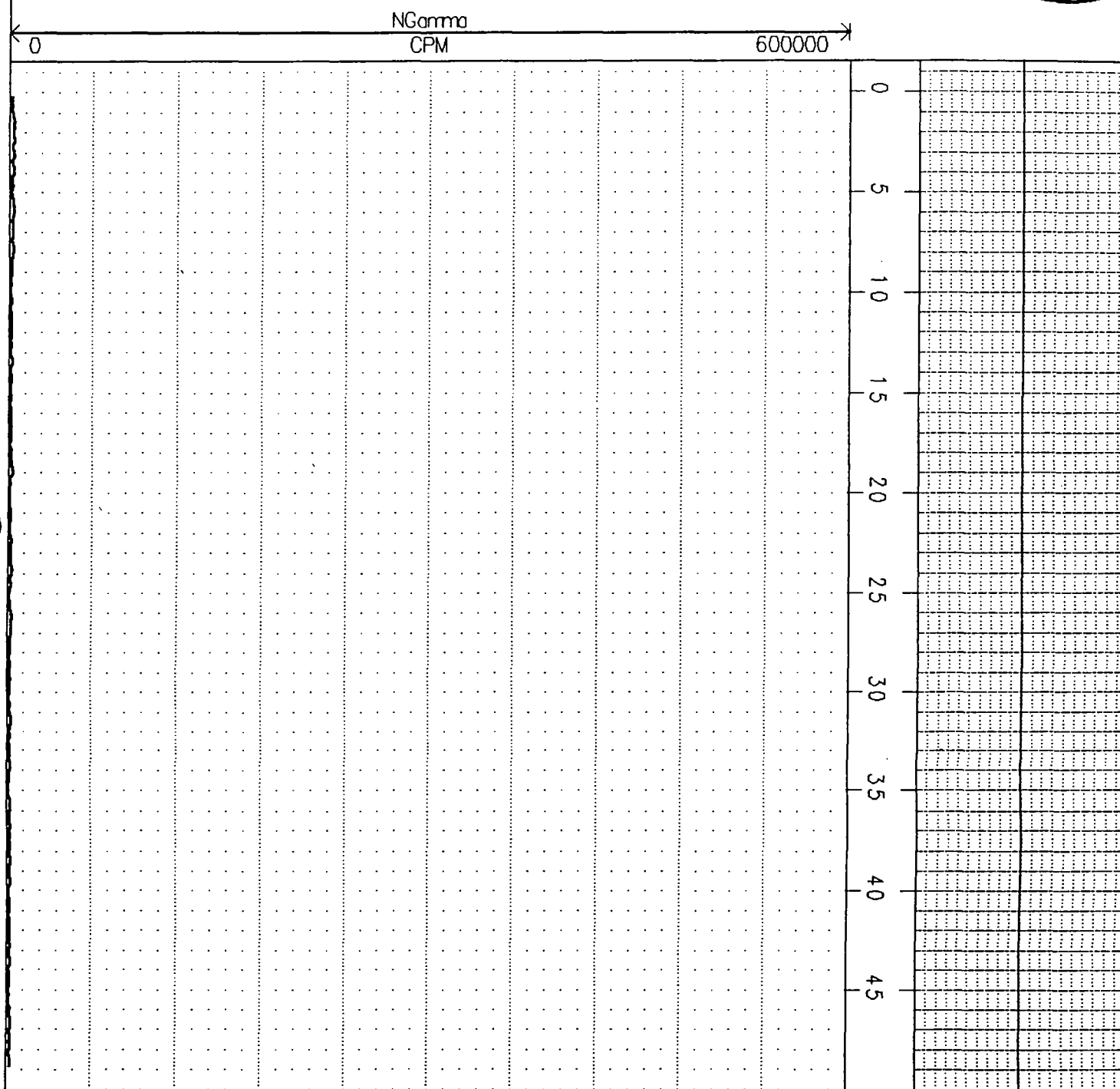
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← 0 NGamma CPM 600000 →

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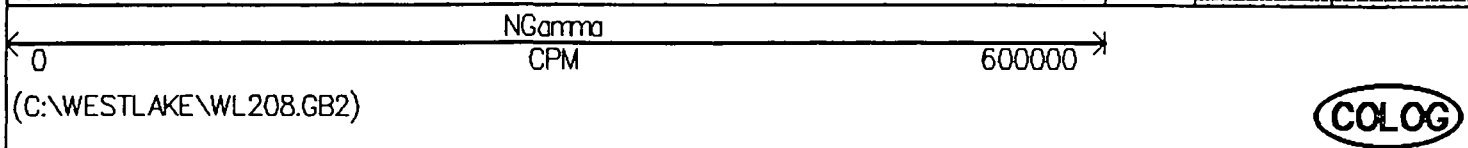
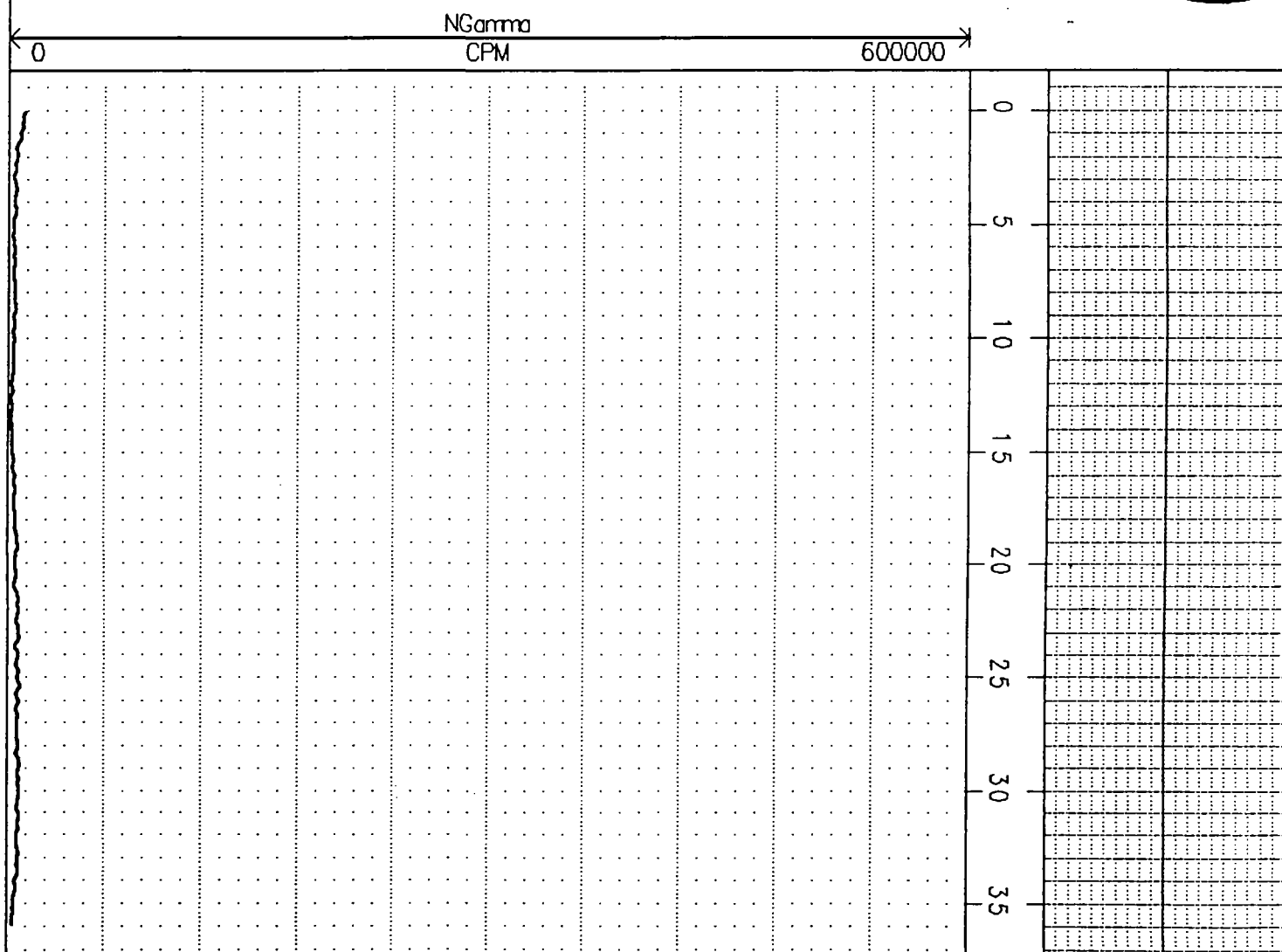
COLOG



← 0 NGamma CPM 600000 →
(C:\WESTLAKE\WL207D.GB0) **COLOG**

(C:\WESTLAKE\WL208.GB2)

COLOG



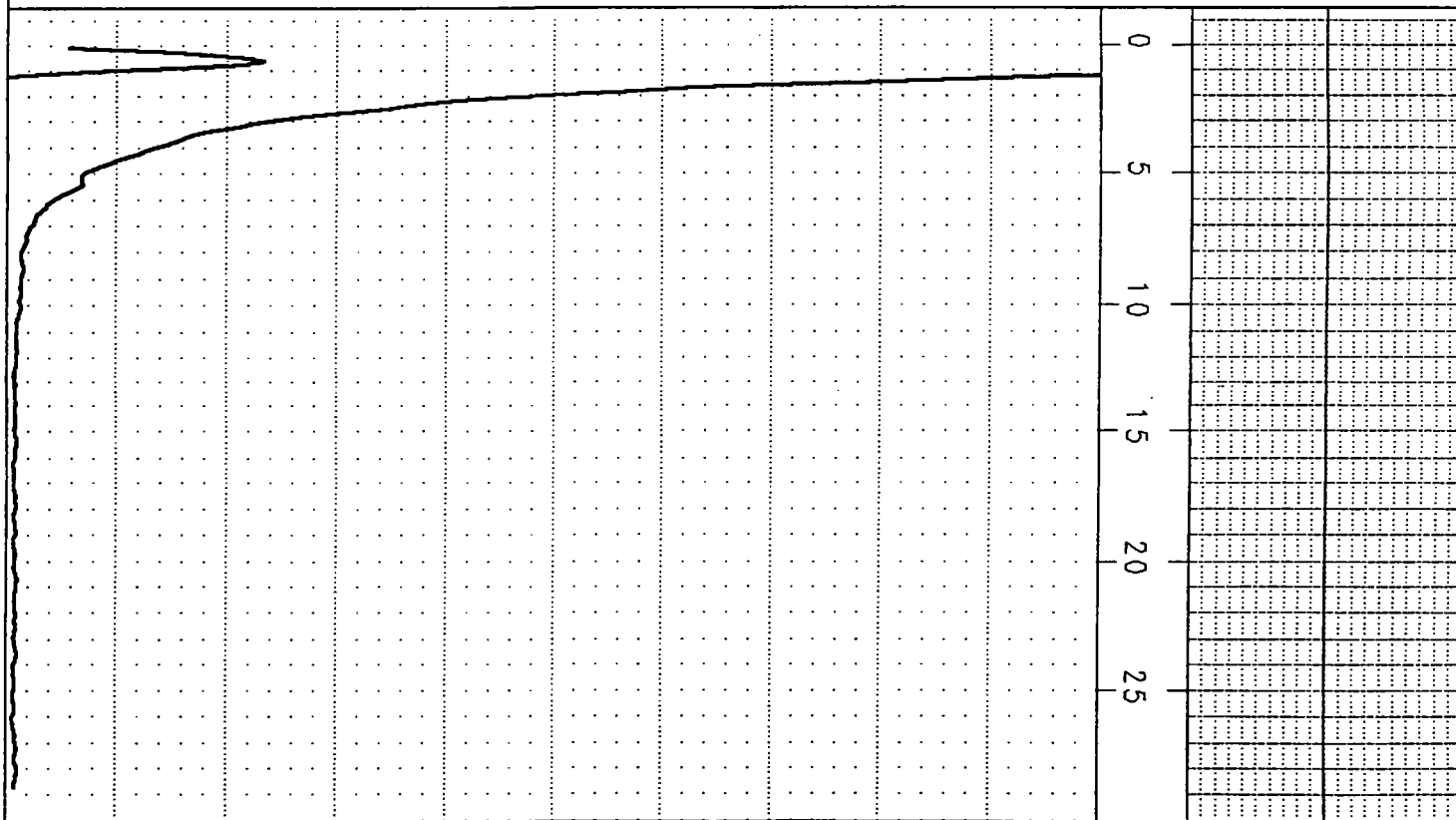
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COLOG

(C:\WESTLAKE\WL209.GB0)

COLOG

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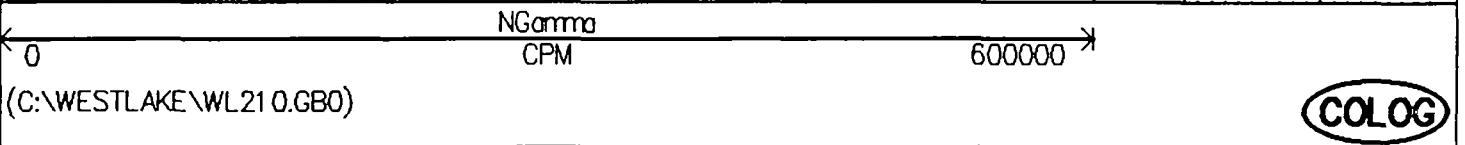
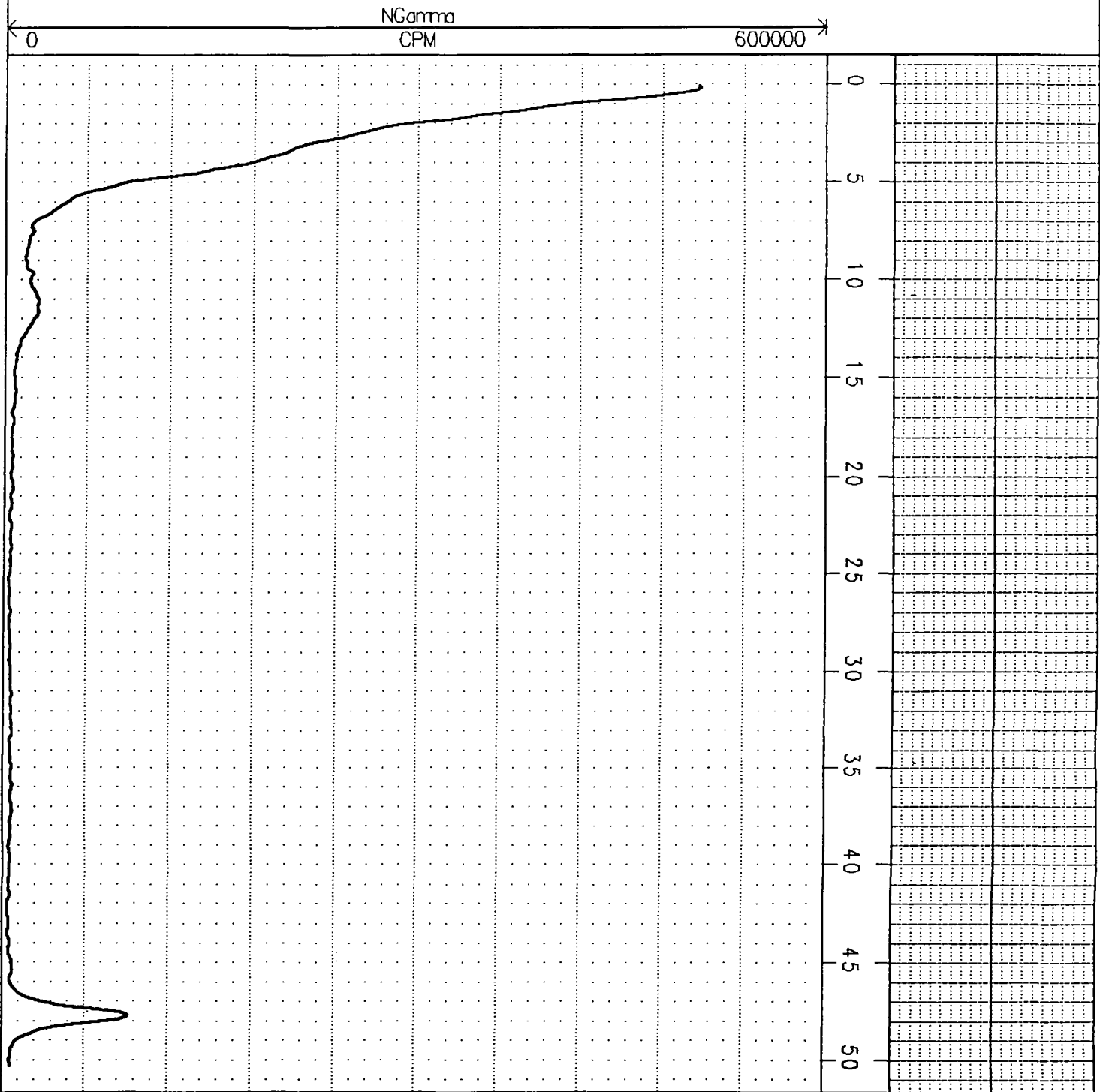
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COLOG

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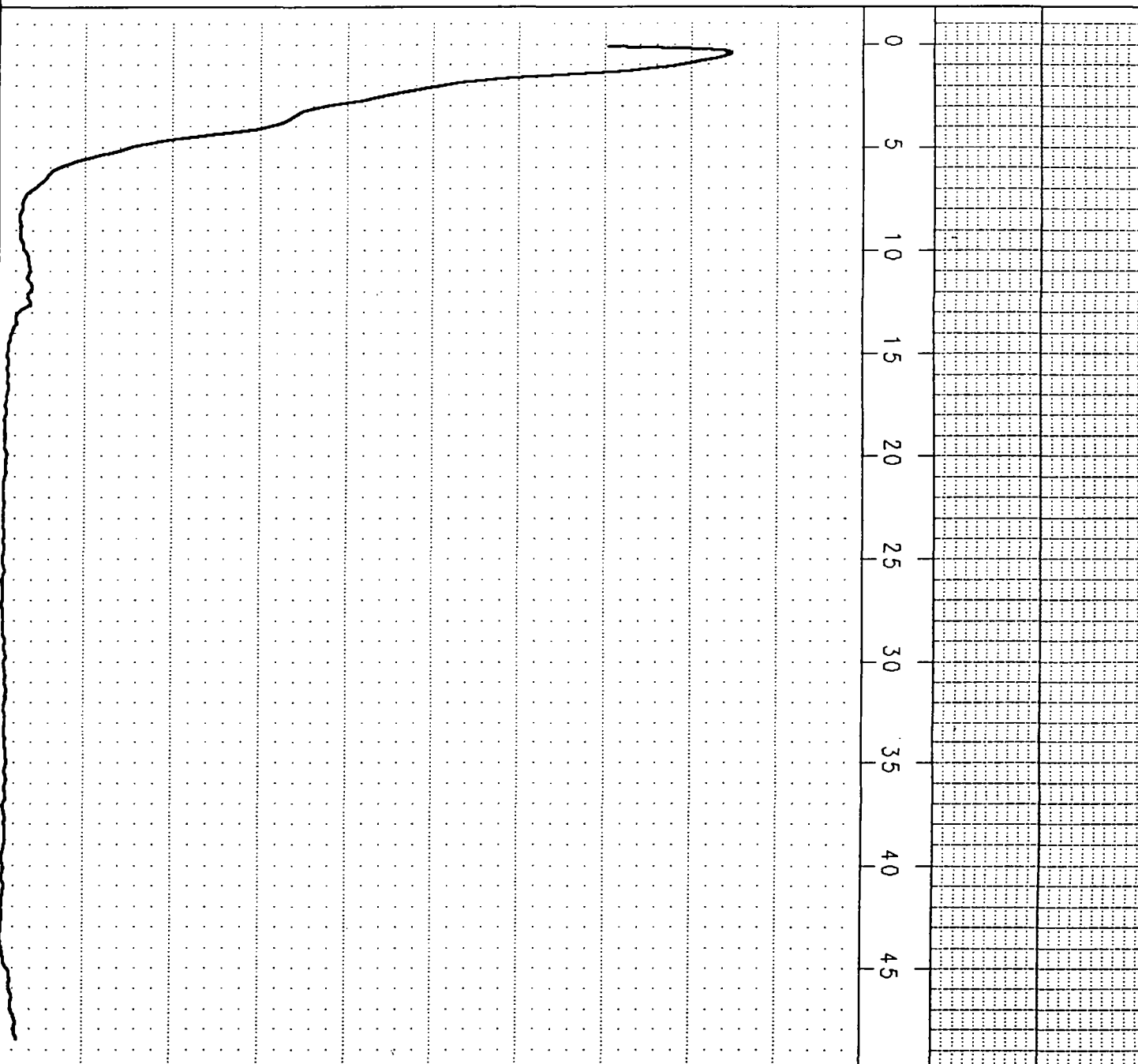
COLOG



(C:\WESTLAKE\WL21 0T.GB0)

COLOG

← 0 NGamma CPM 600000 →



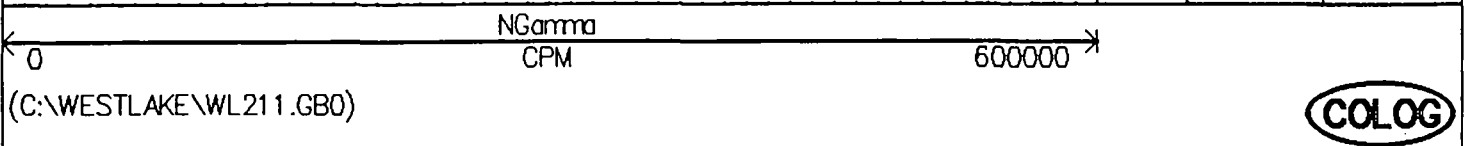
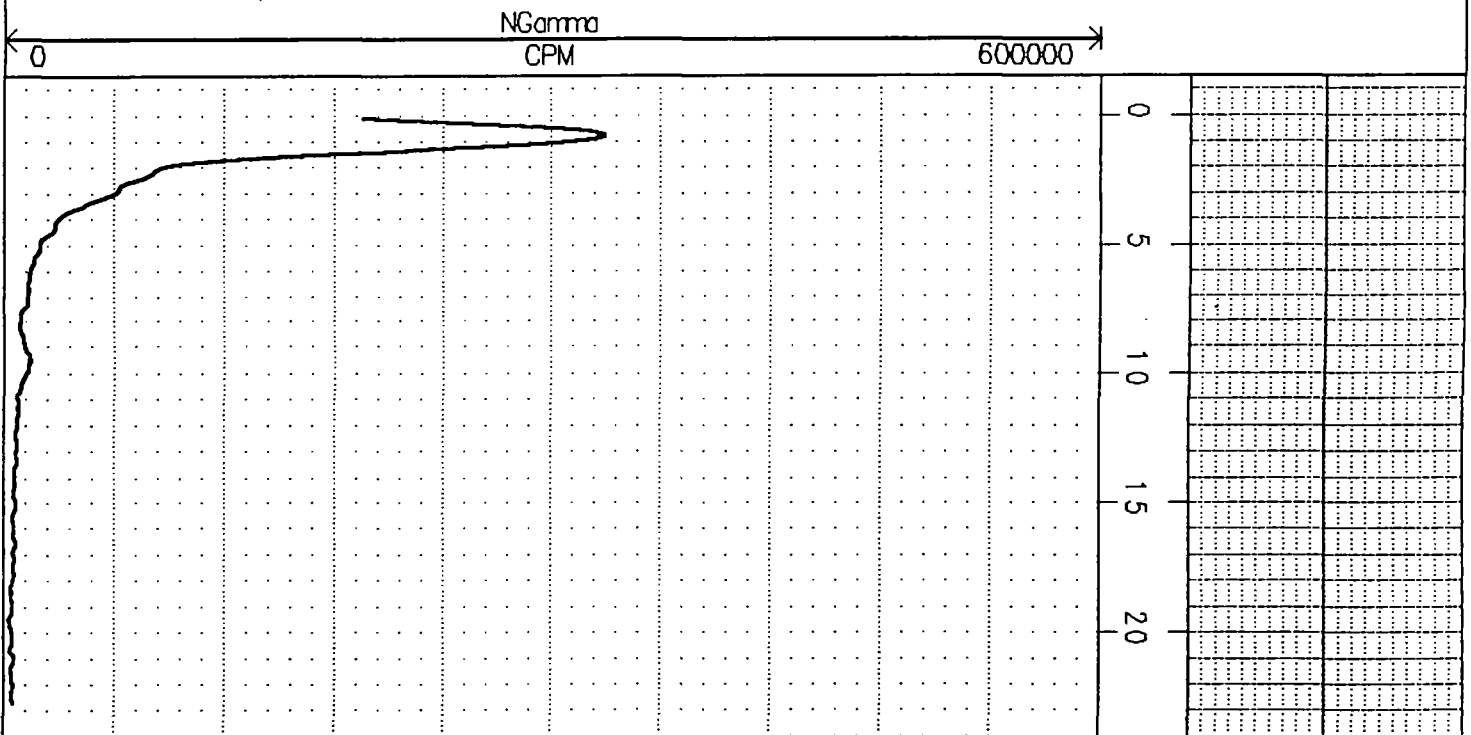
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(C:\WESTLAKE\WL21 0T.GB0)

COLOG

(C:\WESTLAKE\WL211.GB0)

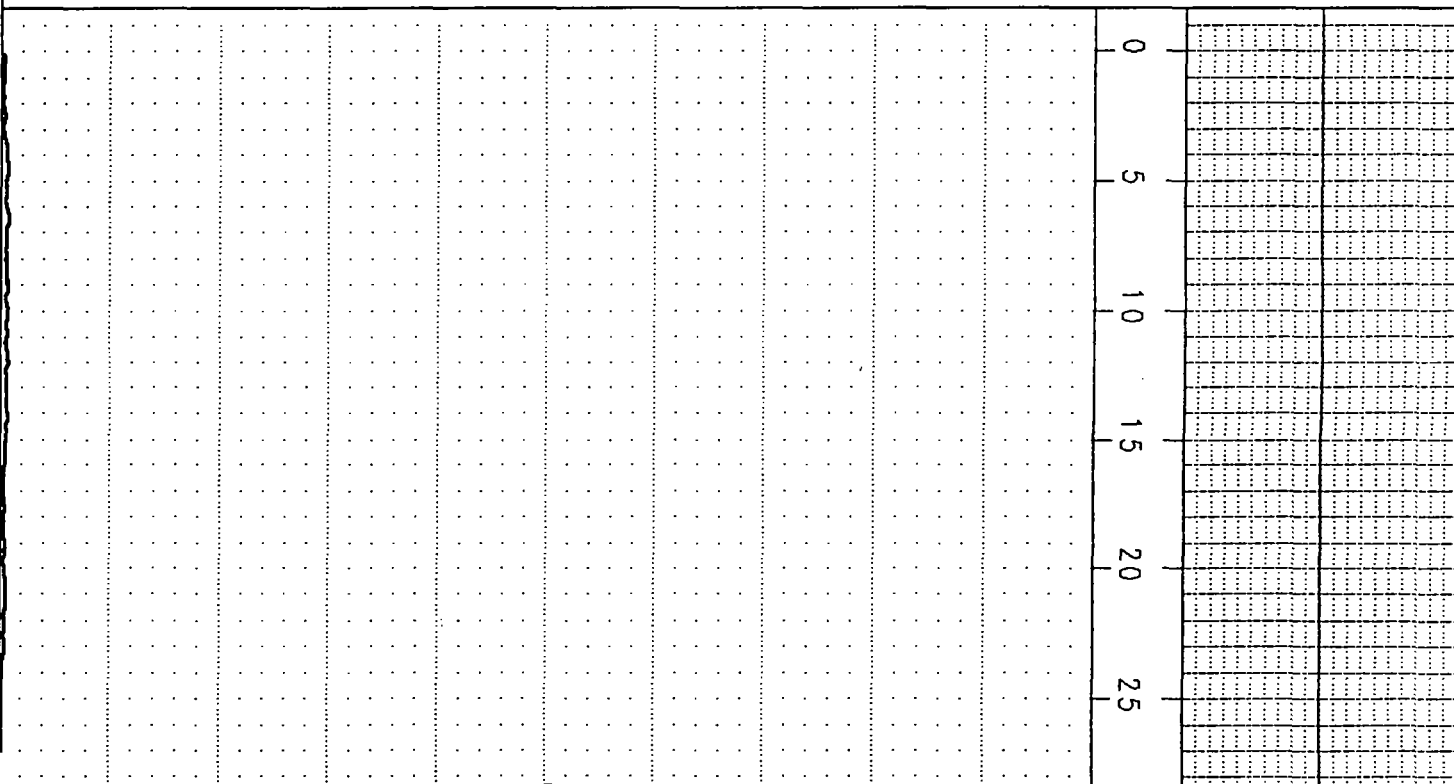
COLOG



(C:\WESTLAKE\WL21 2.GB0)

COLOG

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← 0 NGamma CPM 600000 →

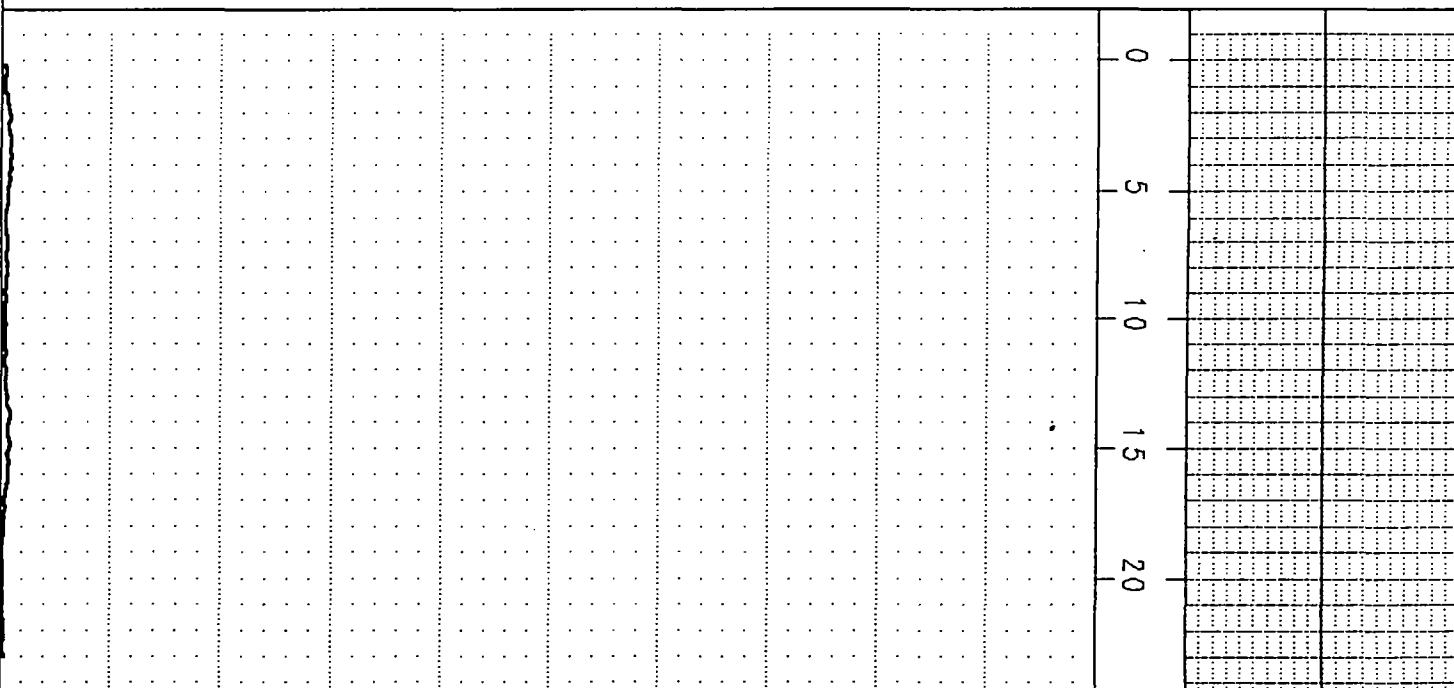
(C:\WESTLAKE\WL21 2.GB0)

COLOG

(C:\WESTLAKE\WL21 3.GB0)

COLOG

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← 0 NGamma CPM 600000 →

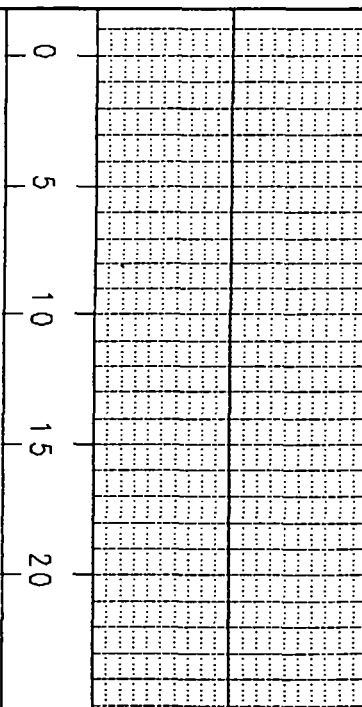
(C:\WESTLAKE\WL21 3.GB0)

COLOG

(C:\WESTLAKE\WL21 4.GB0)

COLOG

← 0 NGamma CPM 600000 →



← 0 NGamma CPM 600000 →

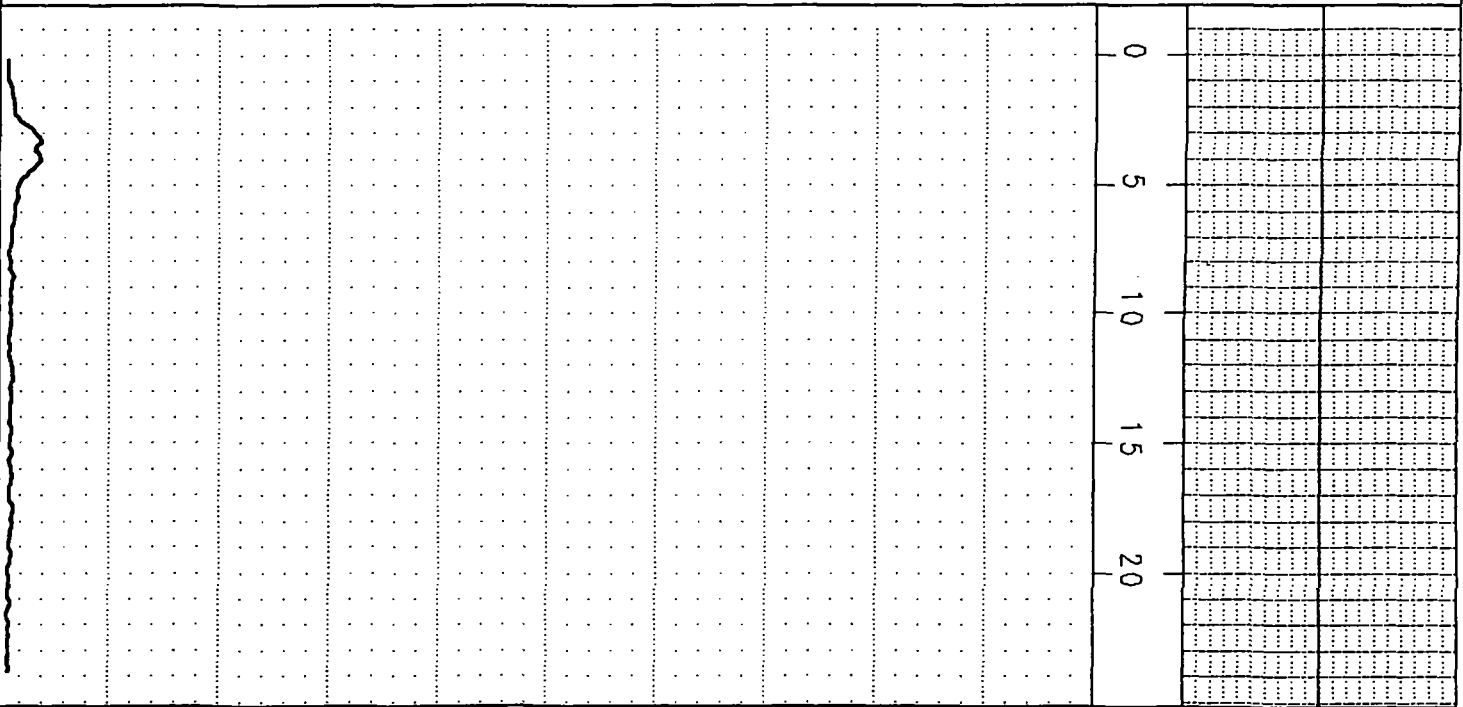
(C:\WESTLAKE\WL21 4.GB0)

COLOG

(C:\WESTLAKE\WL216.GB0)

COLOG

0 NGamma CPM 600000



0 NGamma CPM 600000

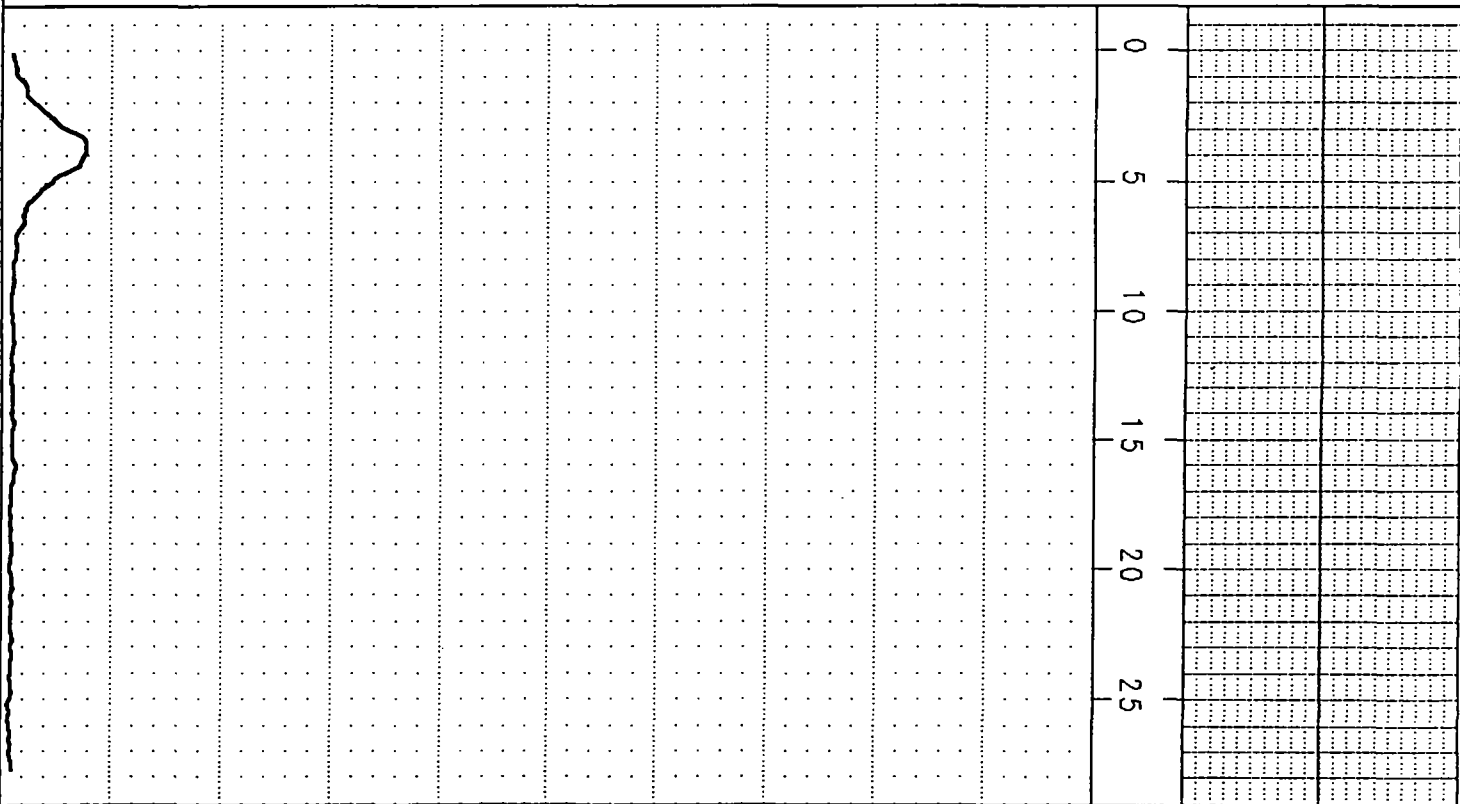
(C:\WESTLAKE\WL216.GB0)

COLOG

(C:\WESTLAKE\WL216C.GB0)

COLOG

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← 0 NGamma CPM 600000 →

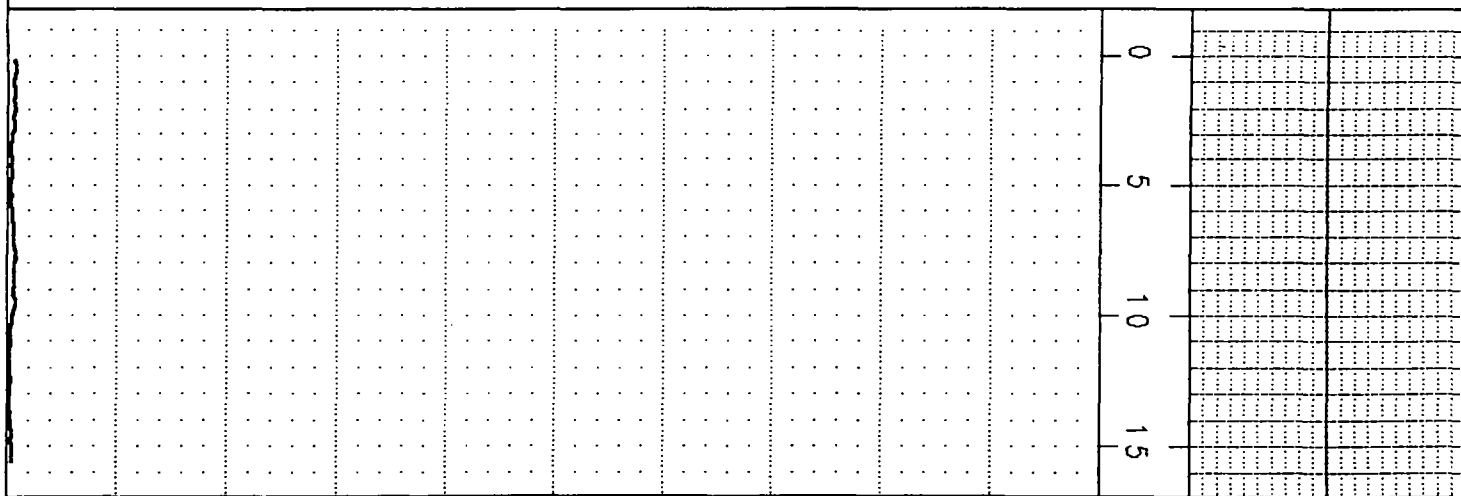
(C:\WESTLAKE\WL216C.GB0)

COLOG

(C:\WESTLAKE\WL217.GB0)

COLOG

← 0 NGamma CPM 600000 →



← 0 NGamma CPM 600000 →

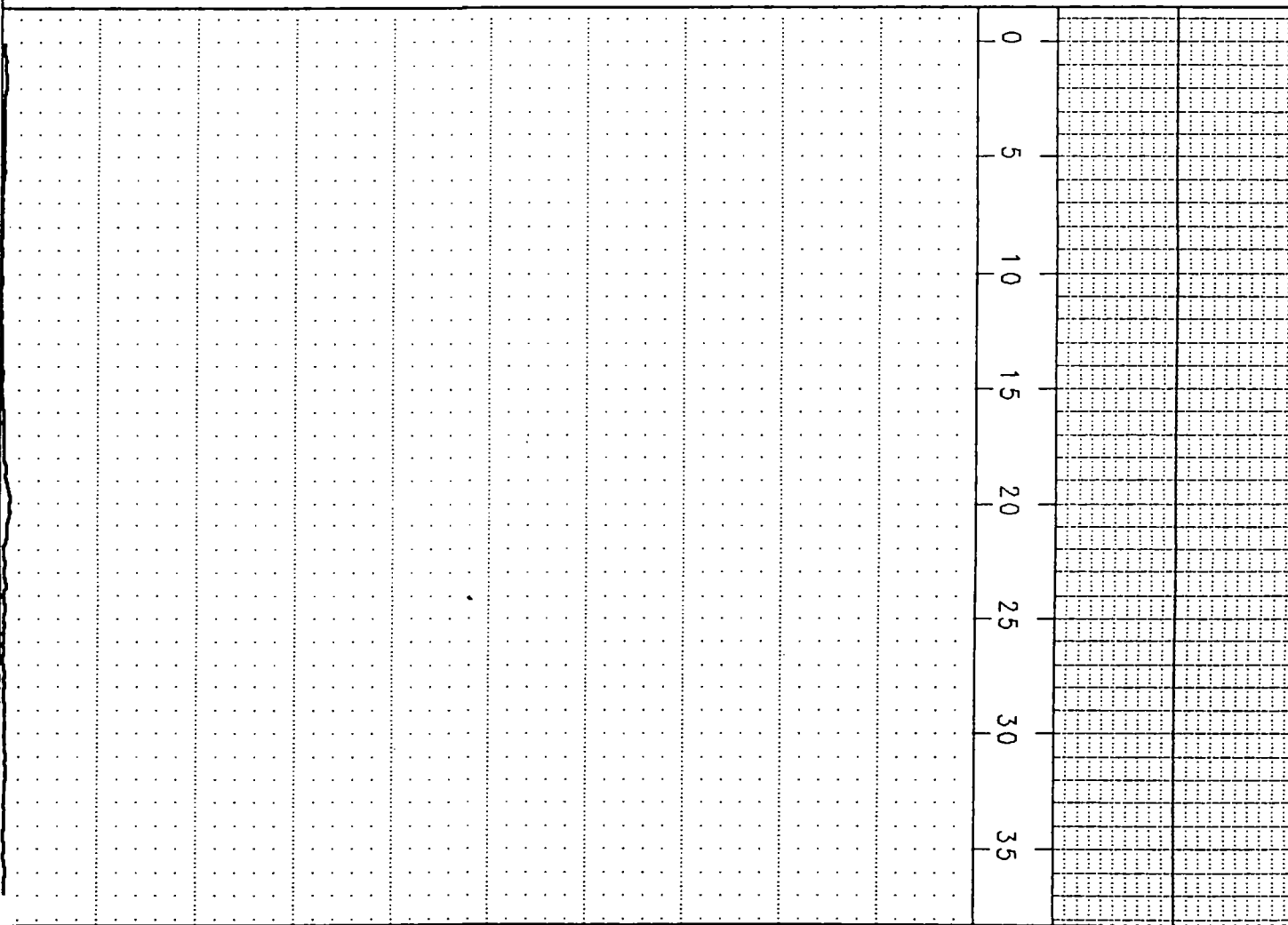
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COLOG

(C:\WESTLAKE\WL218.GB0)

COLOG

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← 0 NGamma CPM 600000 →

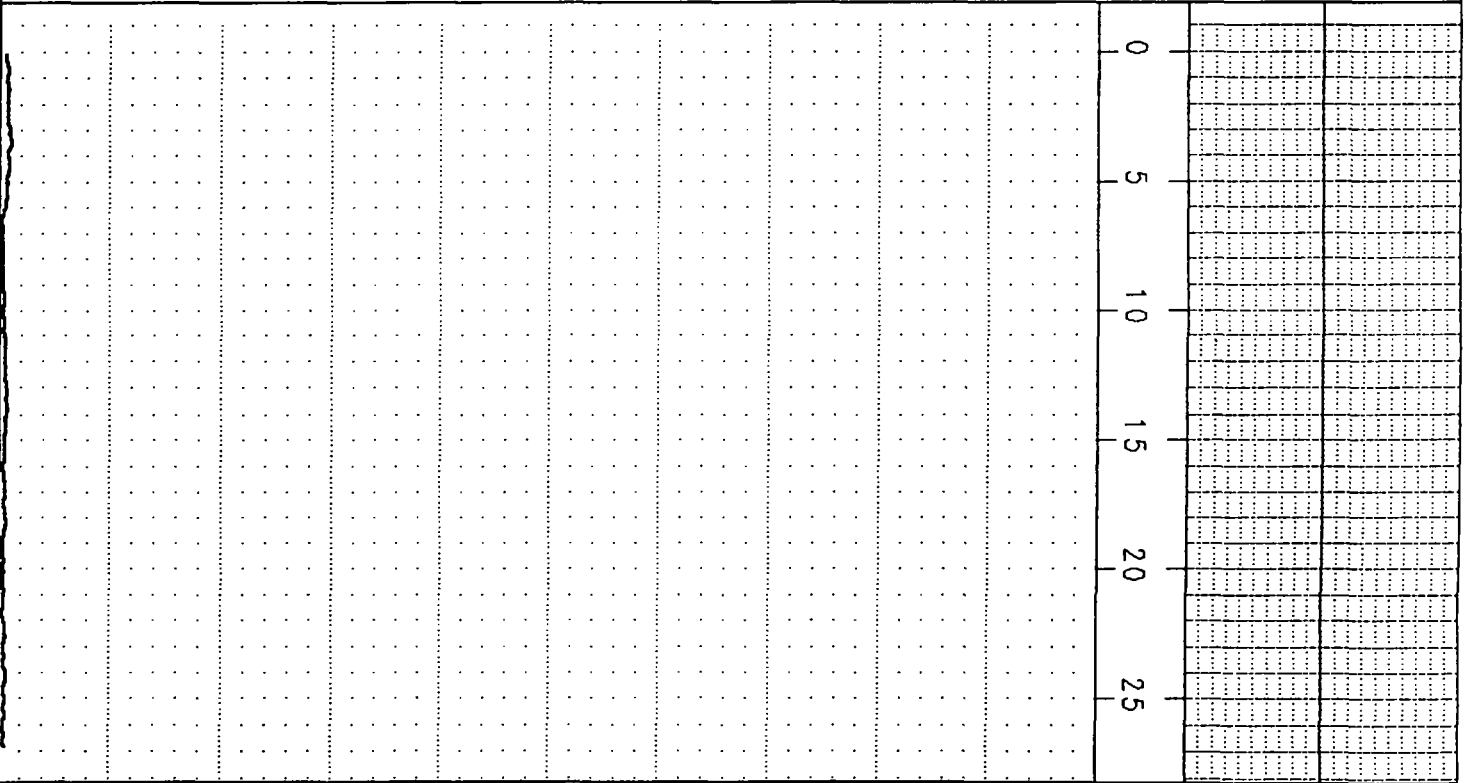
(C:\WESTLAKE\WL218.GB0)

COLOG

(C:\WESTLAKE\WL219A.GB0)

COLOG

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← 0 NGamma CPM 600000 →

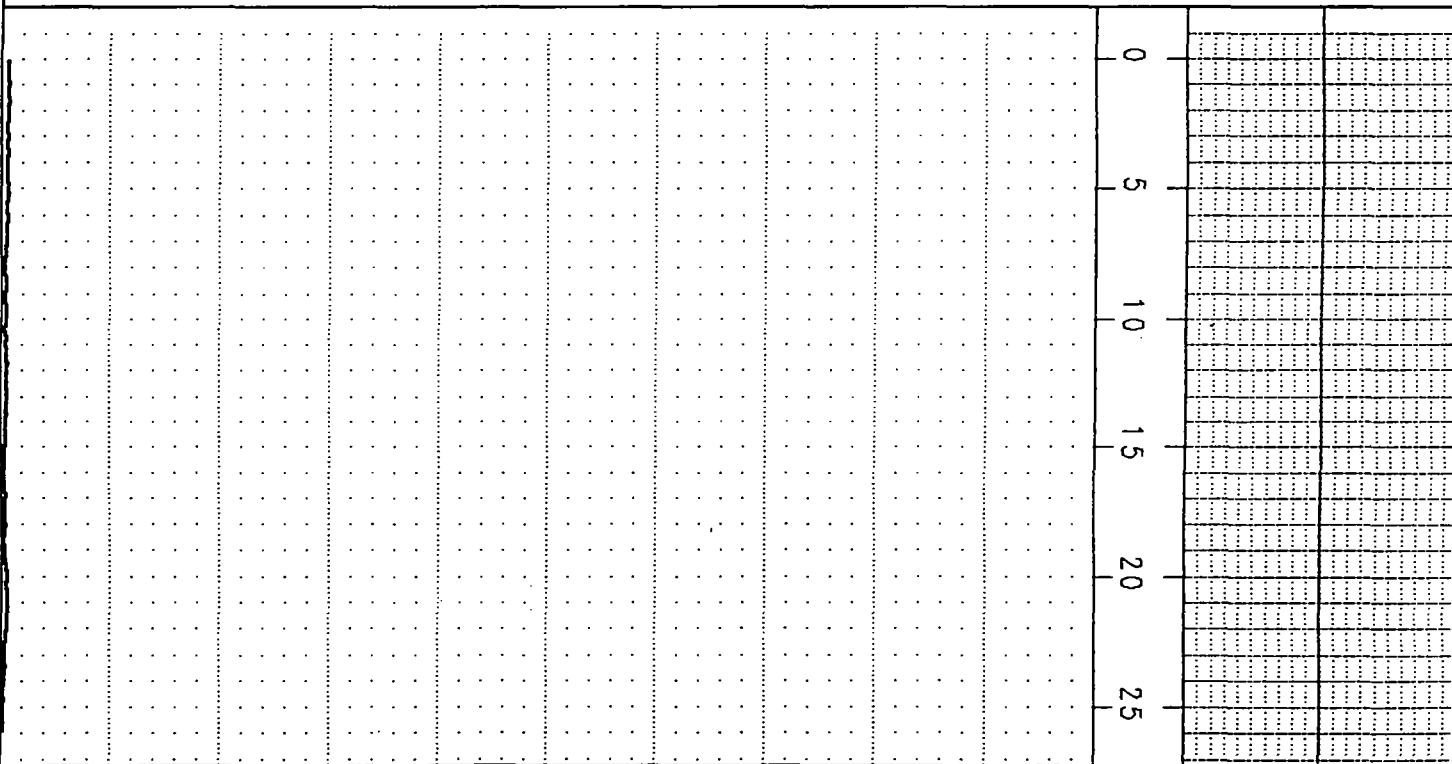
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COLOG

(C:\WESTLAKE\WL220.GB2)

COLOG

← 0 NGamma CPM 600000 →



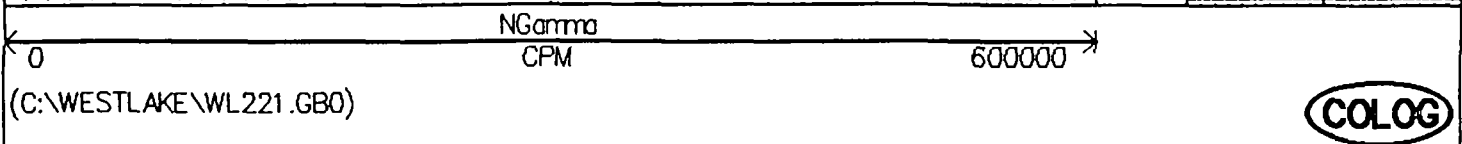
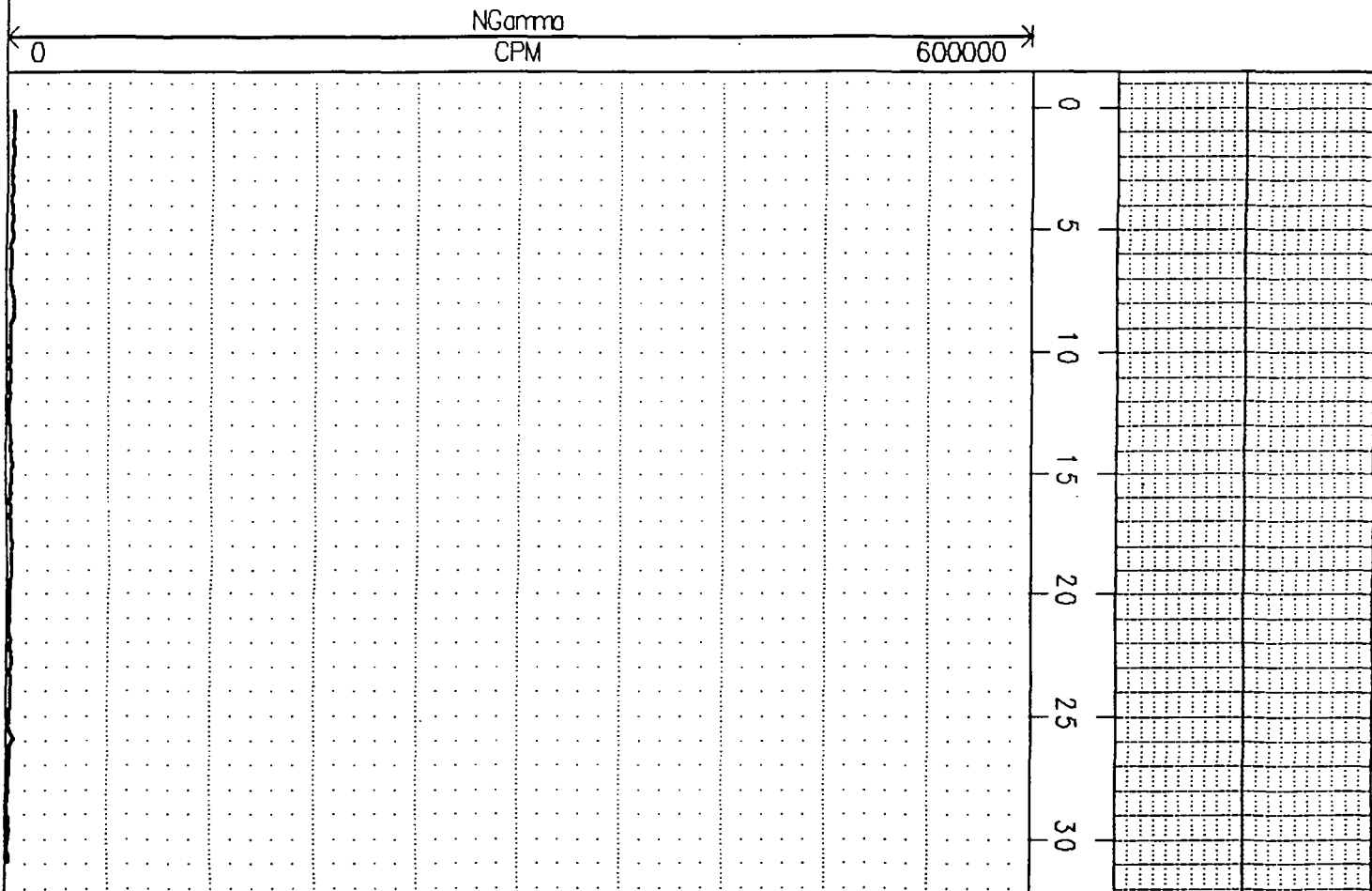
← 0 NGamma CPM 600000 →

(C:\WESTLAKE\WL220.GB2)

COLOG

(C:\WESTLAKE\WL221.GB0)

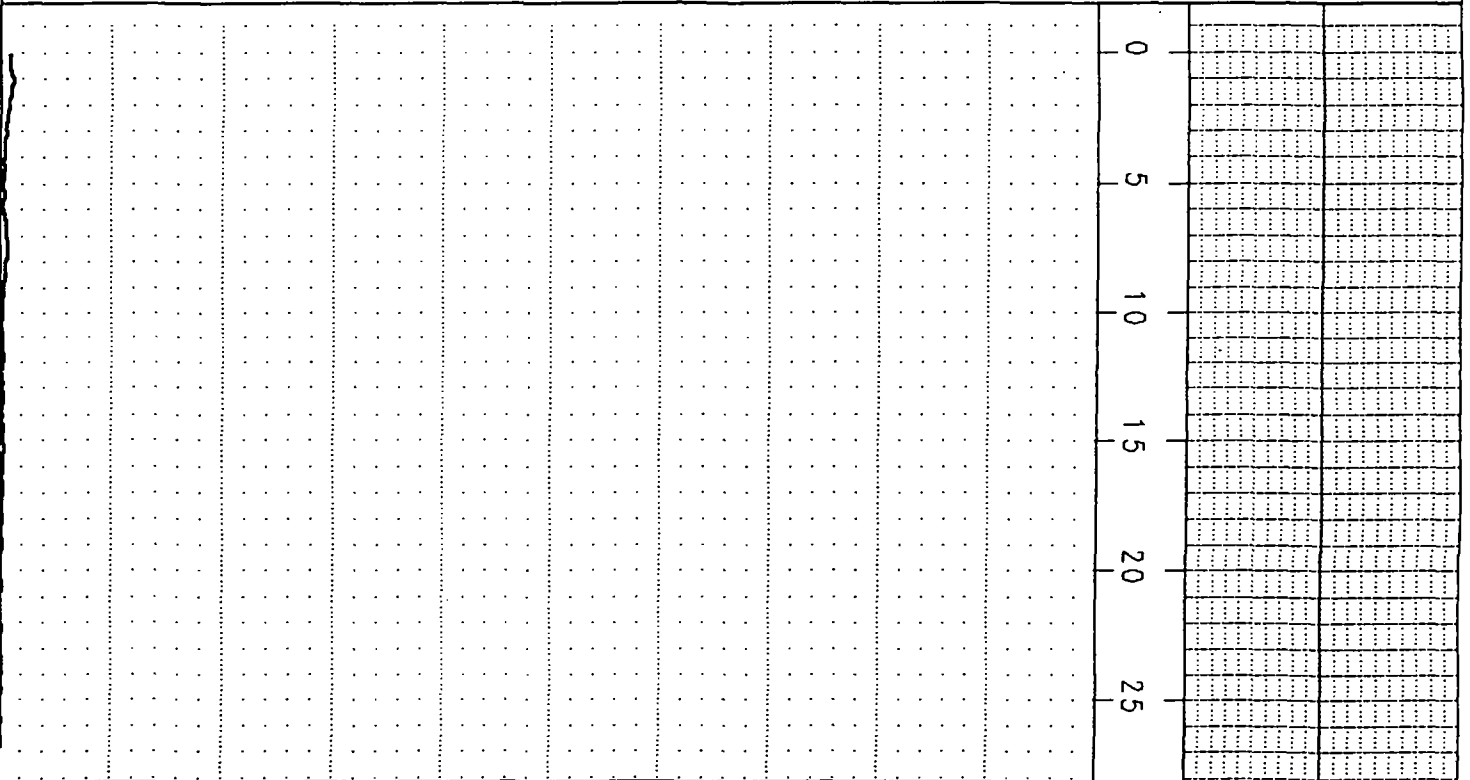
COLOG



(C:\WESTLAKE\WL222.GB0)

COLOG

← 0 NGamma CPM 600000 →



← 0 NGamma CPM 600000 →

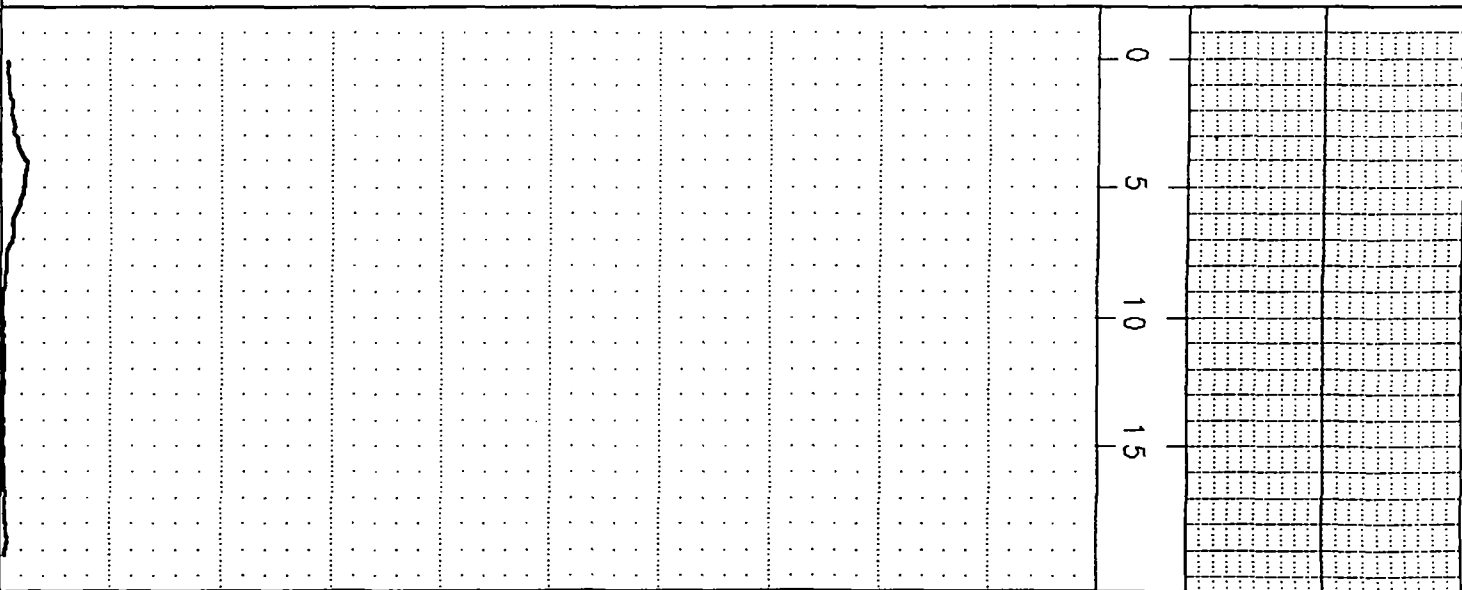
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COLOG

(C:\WESTLAKE\WL223.GB0)

COLOG

← 0 NGamma CPM 600000 →



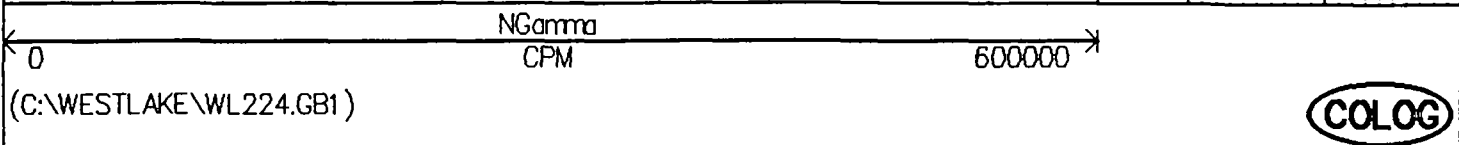
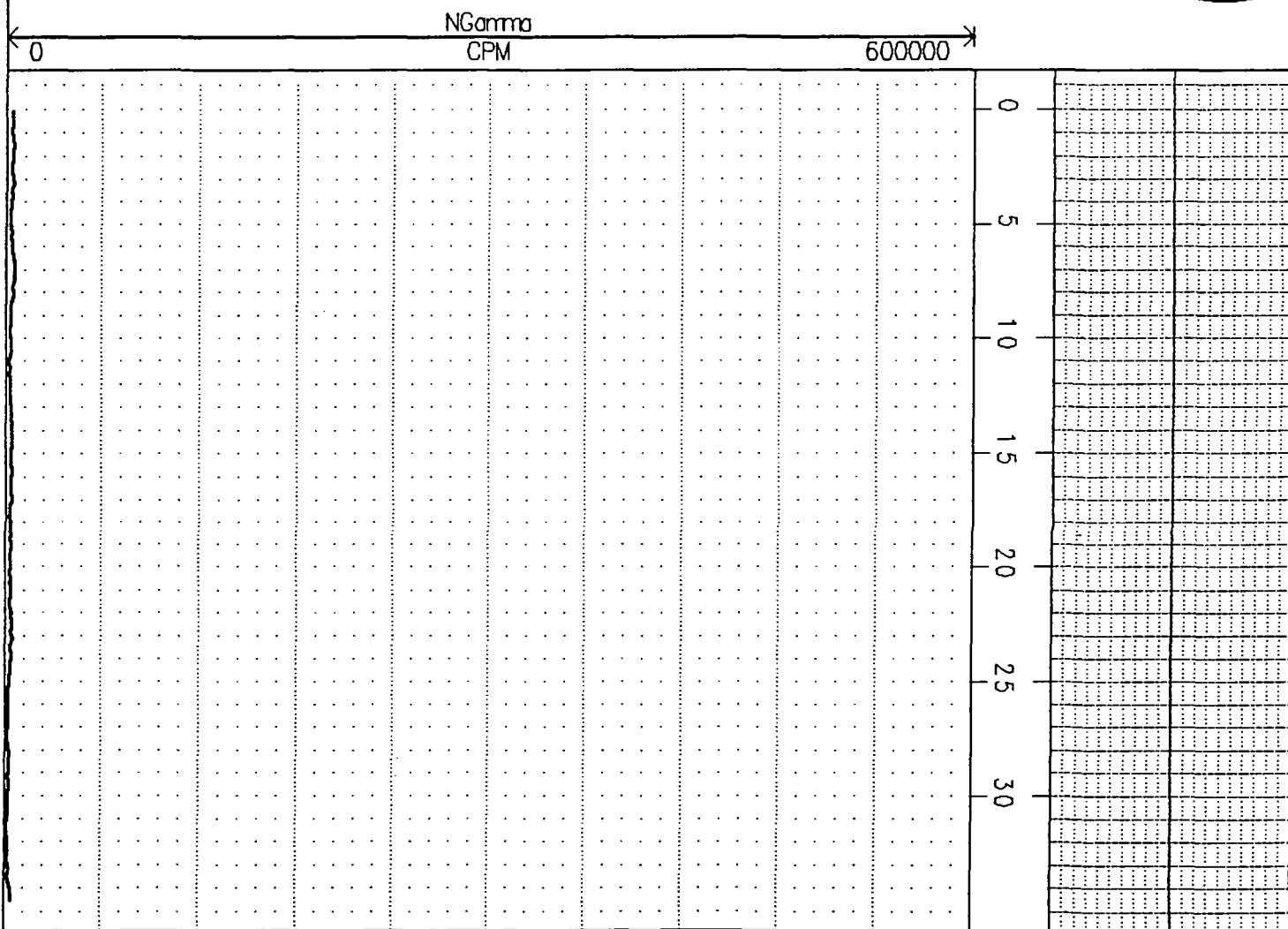
← 0 NGamma CPM 600000 →

(C:\WESTLAKE\WL223.GB0)

COLOG

(C:\WESTLAKE\WL224.GB1)

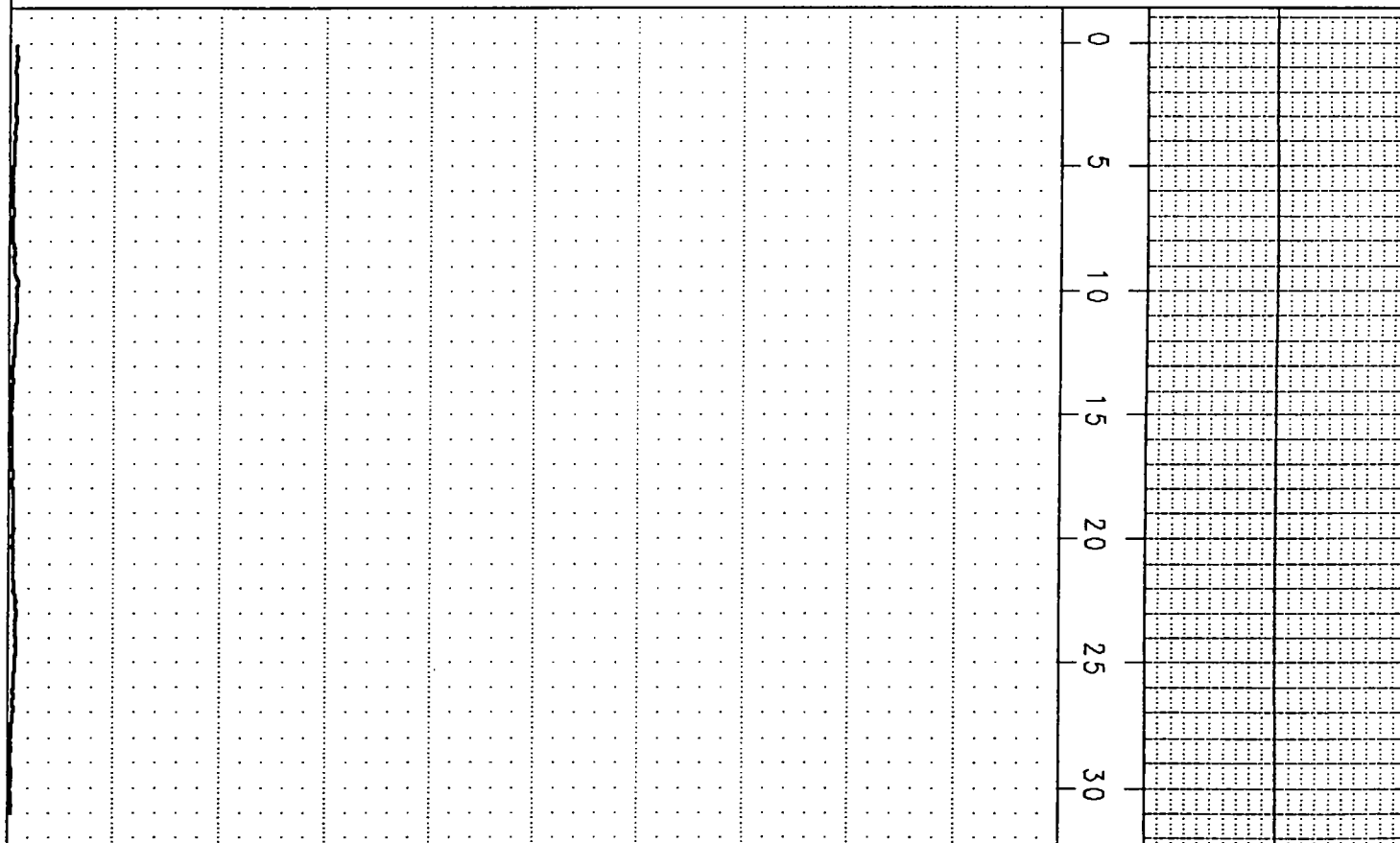
COLOG



(C:\WESTLAKE\WL225.GB1)

COLOG

NGamma
CPM 0 600000



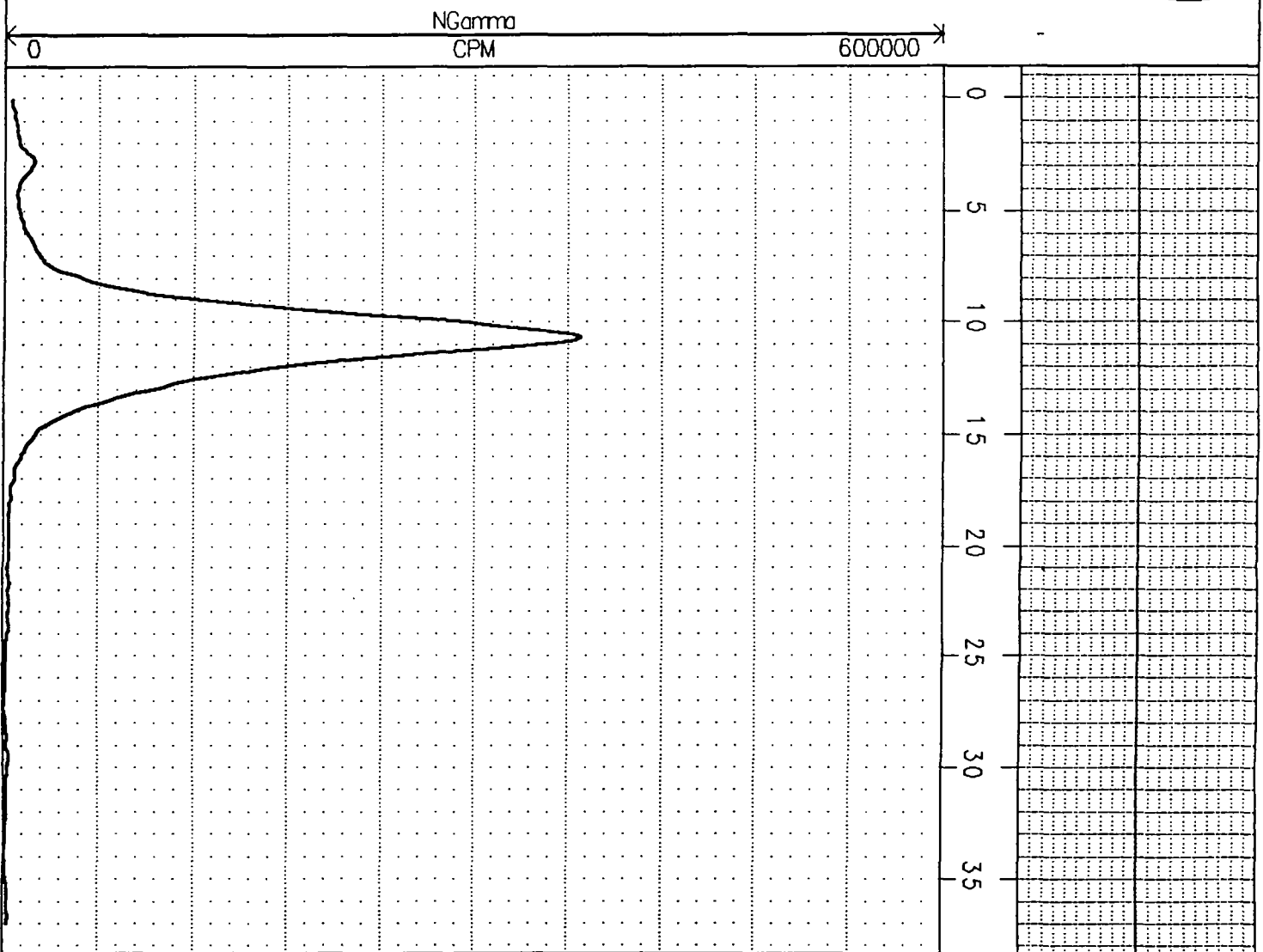
NGamma
CPM 0 600000

(C:\WESTLAKE\WL225.GB1)

COLOG

(C:\WESTLAKE\WL226.GB5)

COLOG



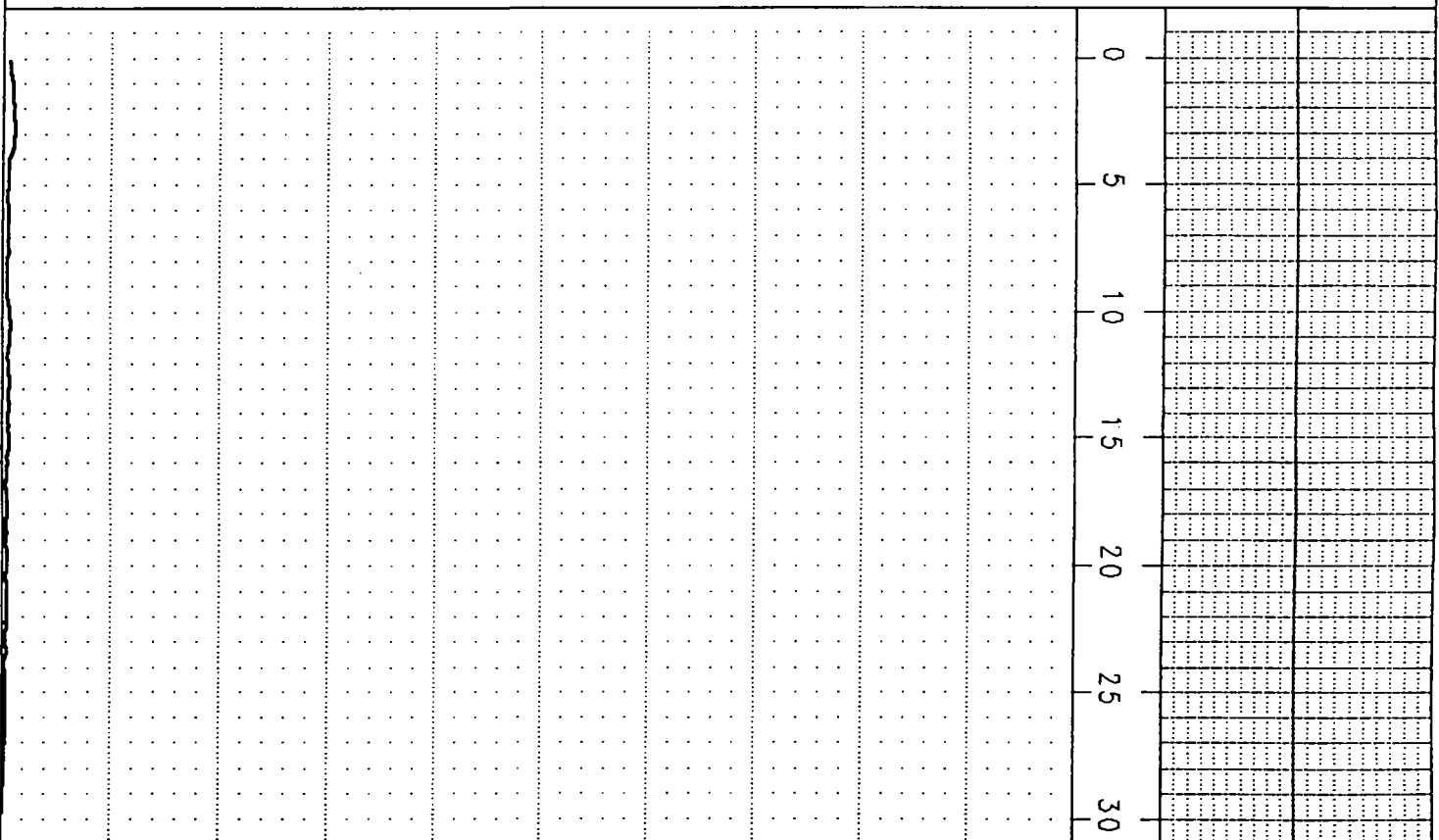
NGamma
CPM

0 600000

(C:\WESTLAKE\WL226.GB5)

COLOG

COLOG

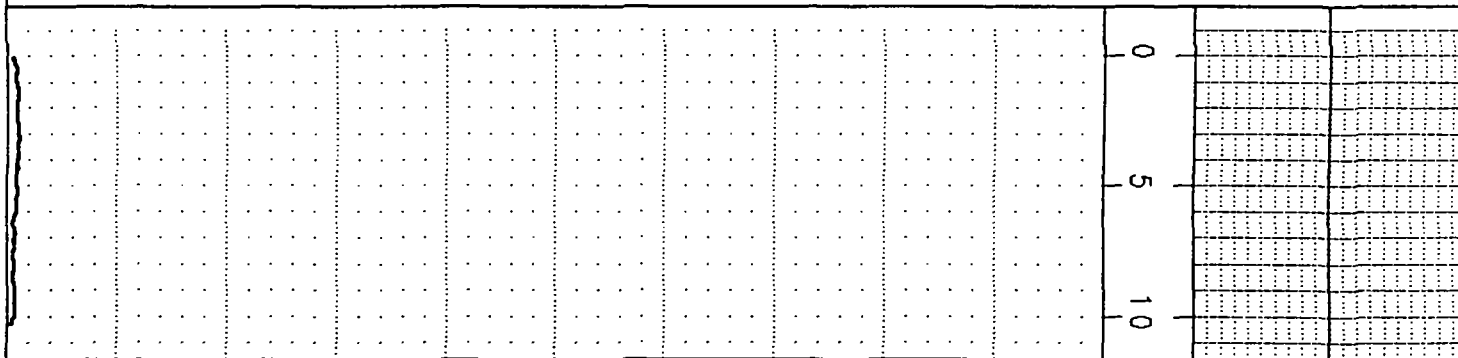


COLOG

(C:\WESTLAKE\WL228.GB0)

COLOG

← 0 NGamma CPM 600000 →



← 0 NGamma CPM 600000 →

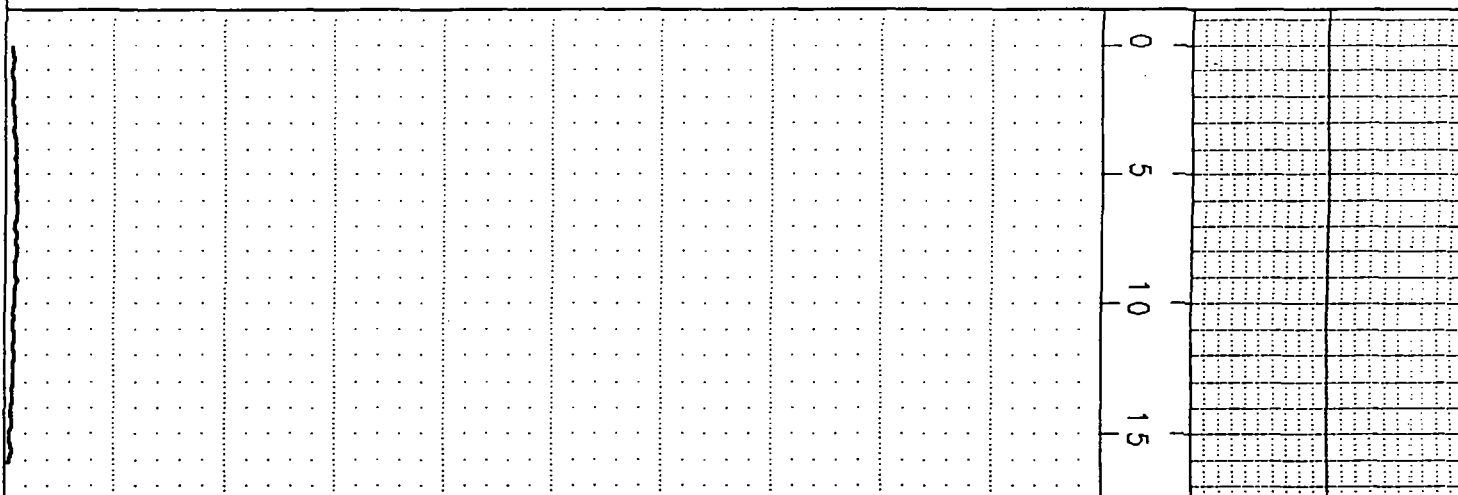
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COLOG

(C:\WESTLAKE\WL229.GB0)

COLOG

NGamma
0 CPM 600000



NGamma
0 CPM 600000

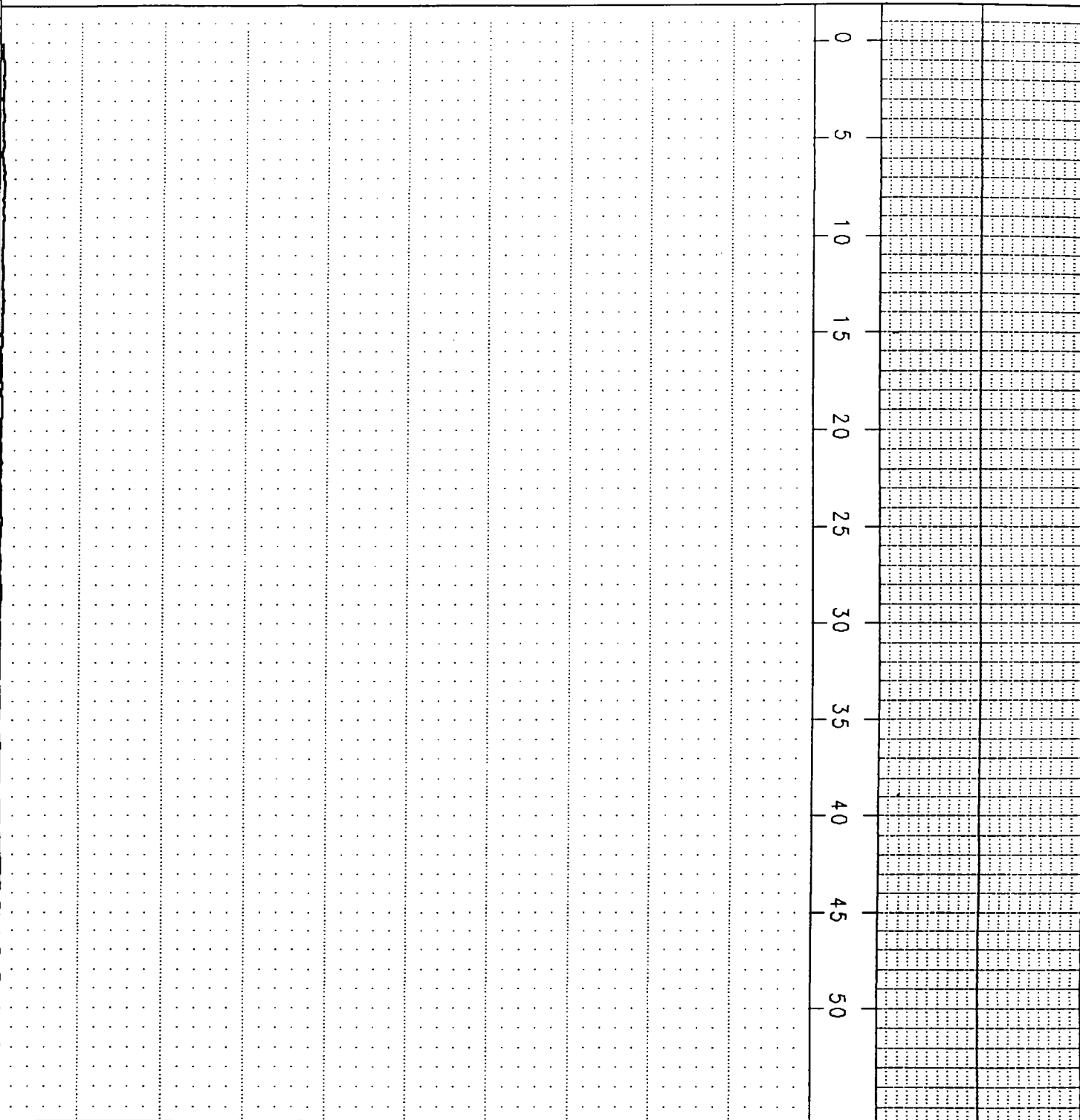
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COLOG

(C:\WESTLAKE\WL229D.GB0)

COLOG

NGamma
CPM 0 600000



NGamma
CPM 0 600000

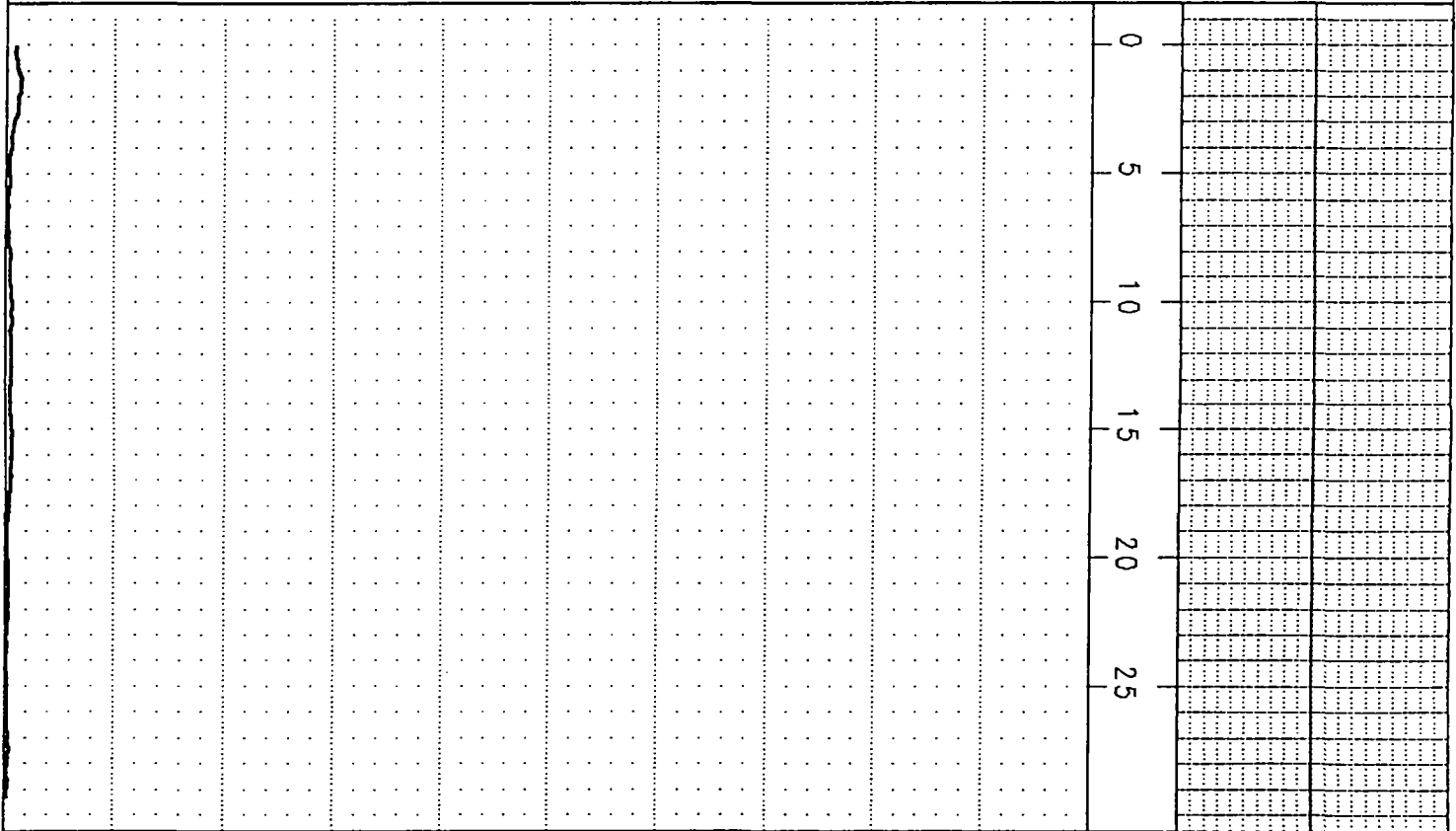
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COLOG

(C:\WESTLAKE\WL230.GB0)

COLOG

← 0 NGamma CPM 600000 →



← 0 NGamma CPM 600000 →

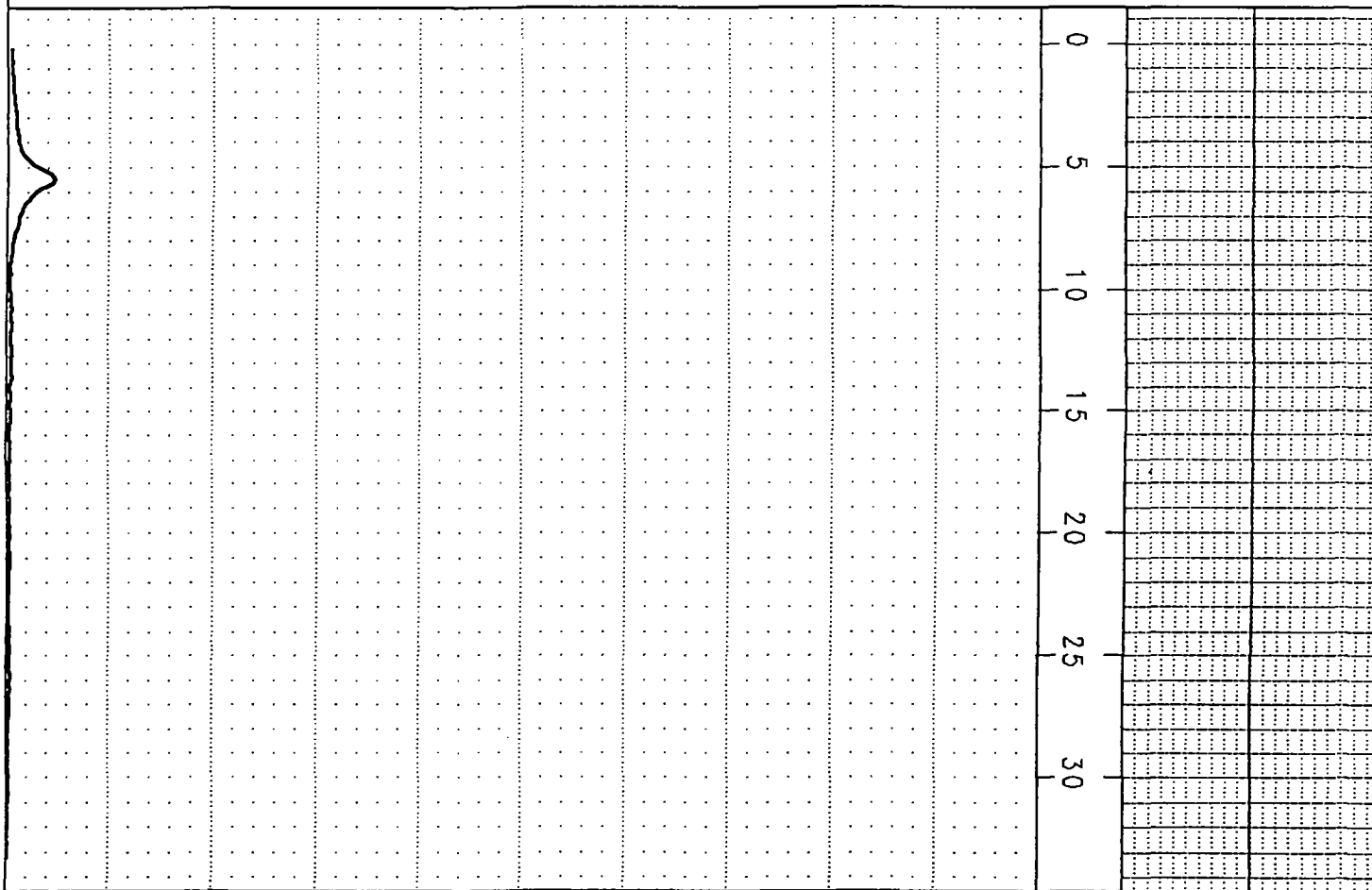
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COLOG

(C:\WESTLAKE\WL231.GB0)

COLOG

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← 0 NGamma CPM 600000 →

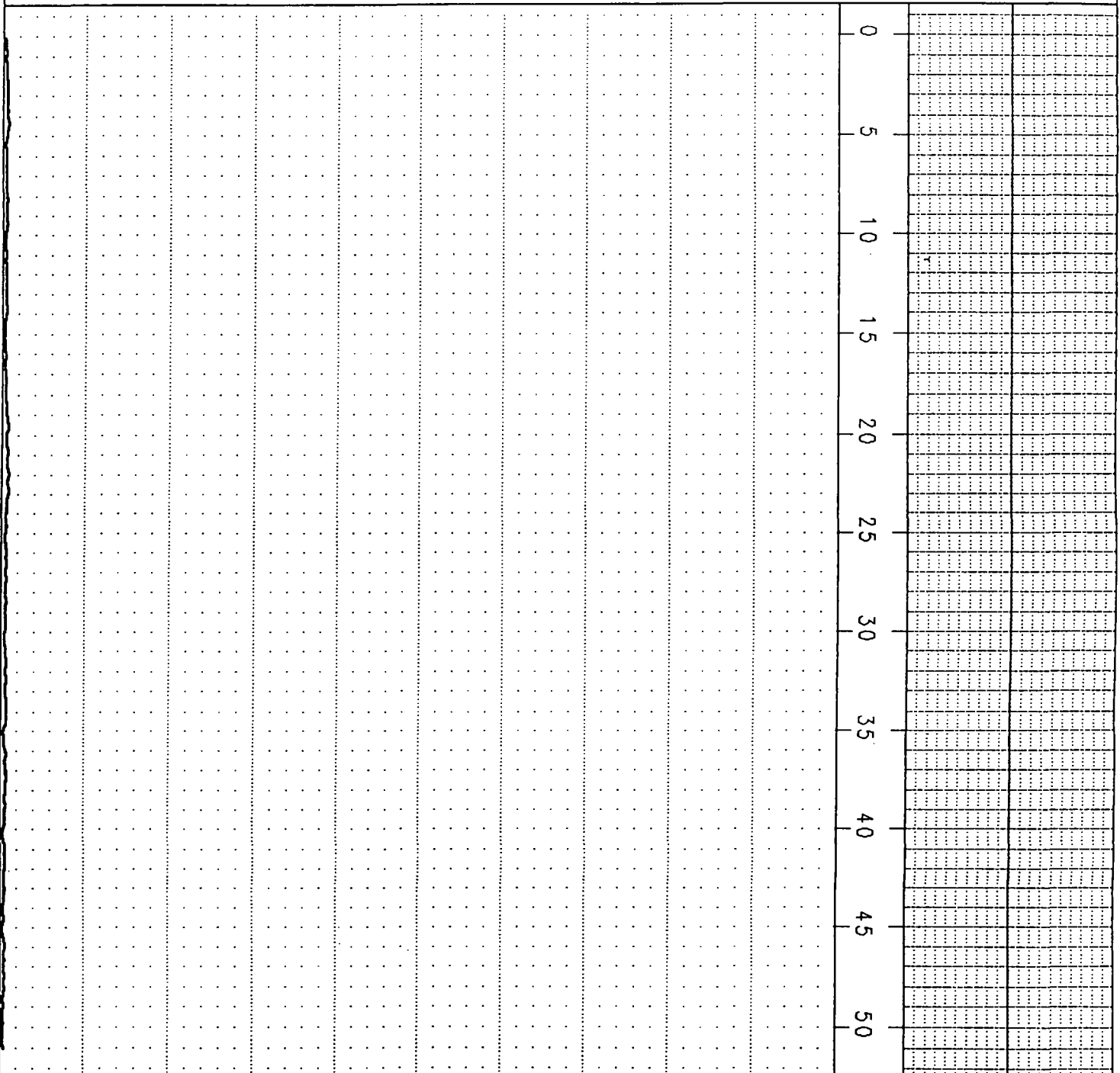
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COLOG

(C:\WESTLAKE\WL232.GB0)

COLOG

NGamma
CPM 0 600000



NGamma
CPM 0 600000

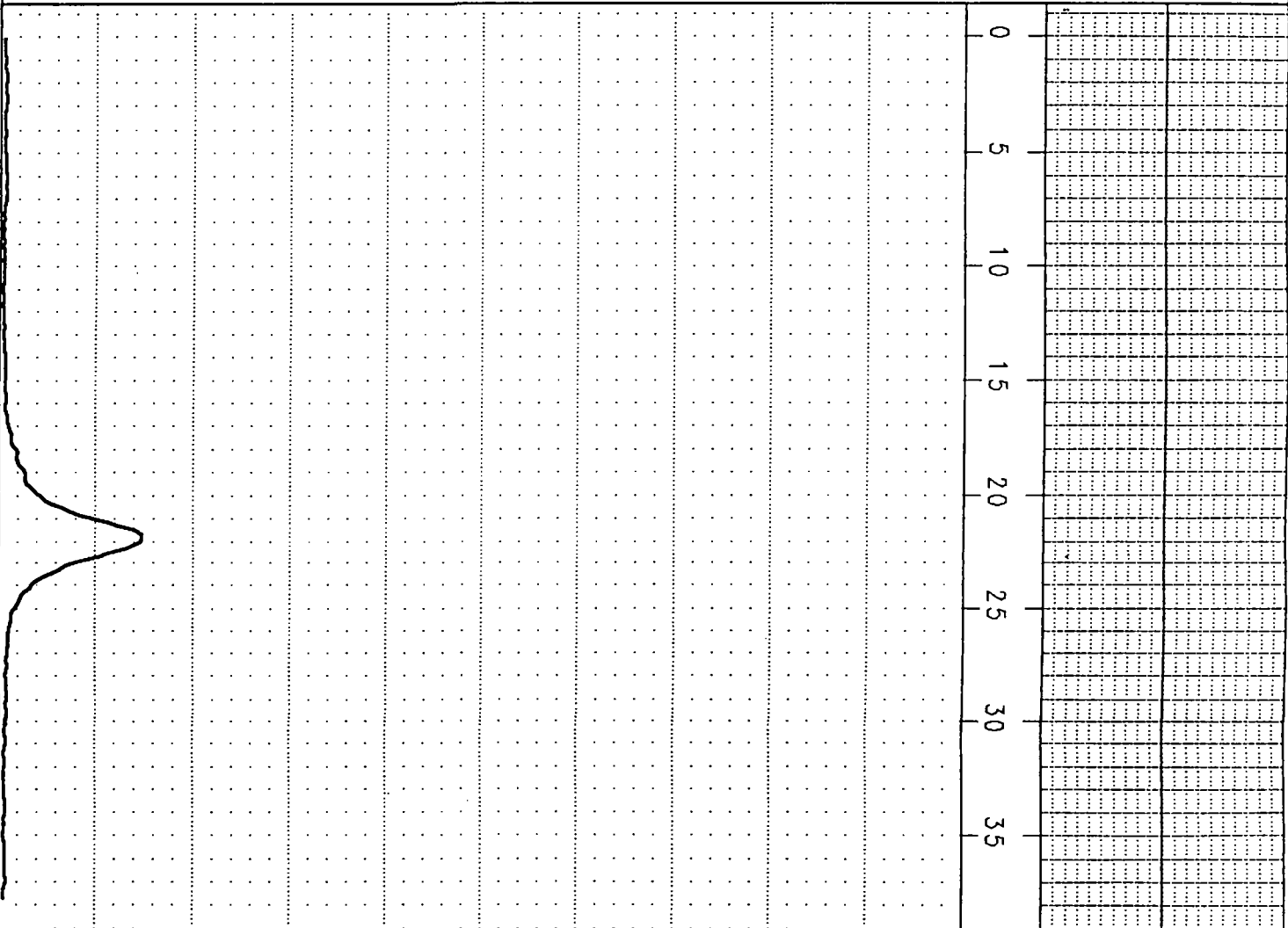
(C:\WESTLAKE\WL232.GB0)

COLOG

(C:\WESTLAKE\WL233.GB0)

COLOG

← 0 NGamma CPM 600000 →



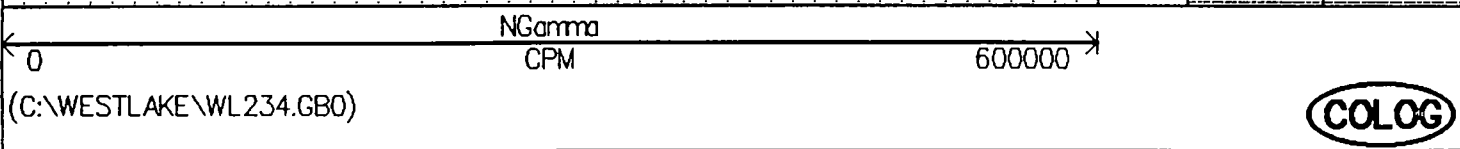
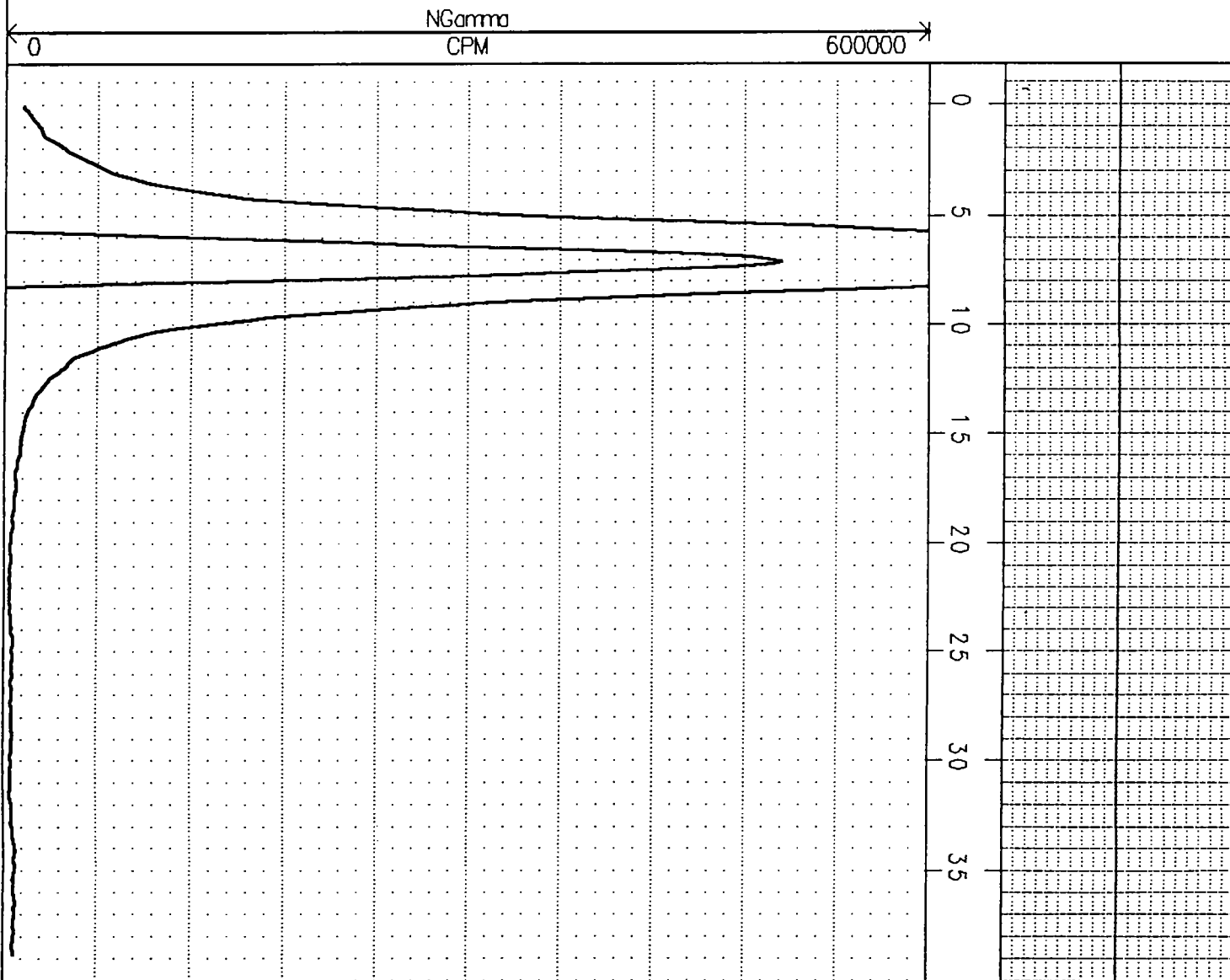
← 0 NGamma CPM 600000 →

(C:\WESTLAKE\WL233.GB0)

COLOG

(C:\WESTLAKE\WL234.GB0)

COLOG

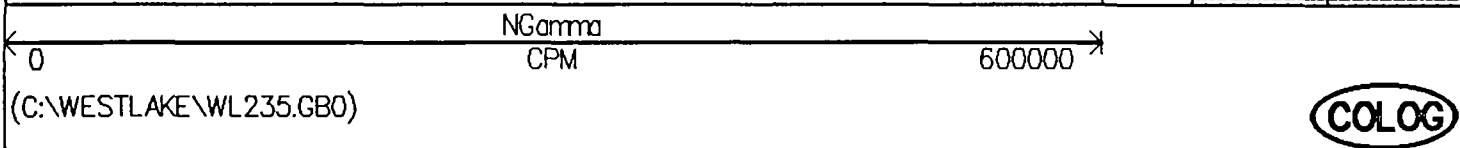
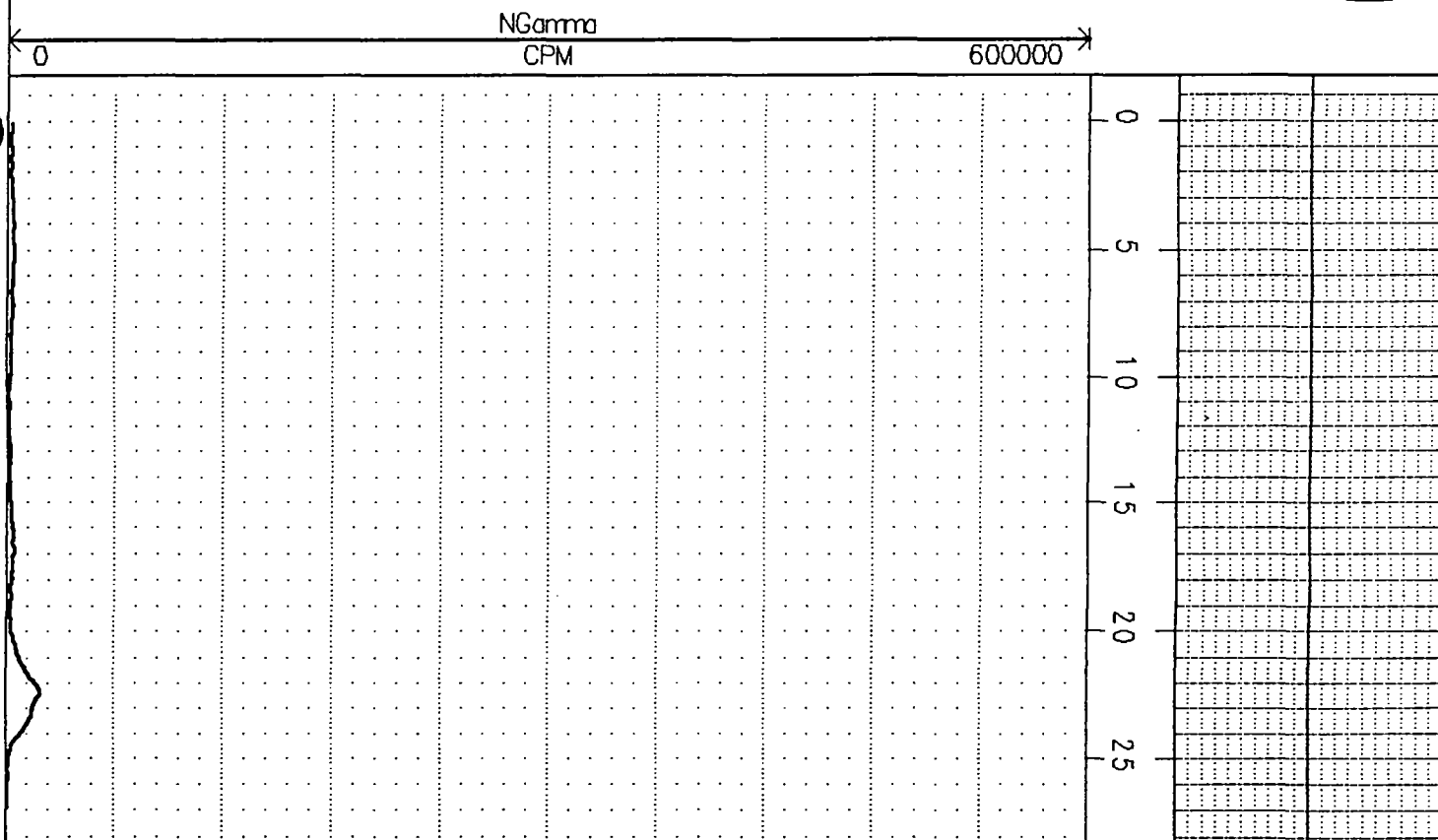


(C:\WESTLAKE\WL234.GB0)

COLOG

(C:\WESTLAKE\WL235.GB0)

COLOG

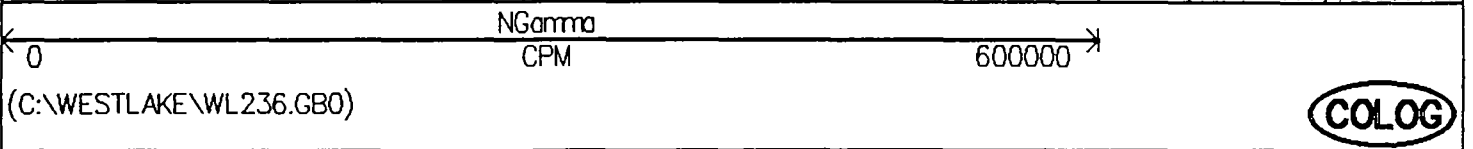
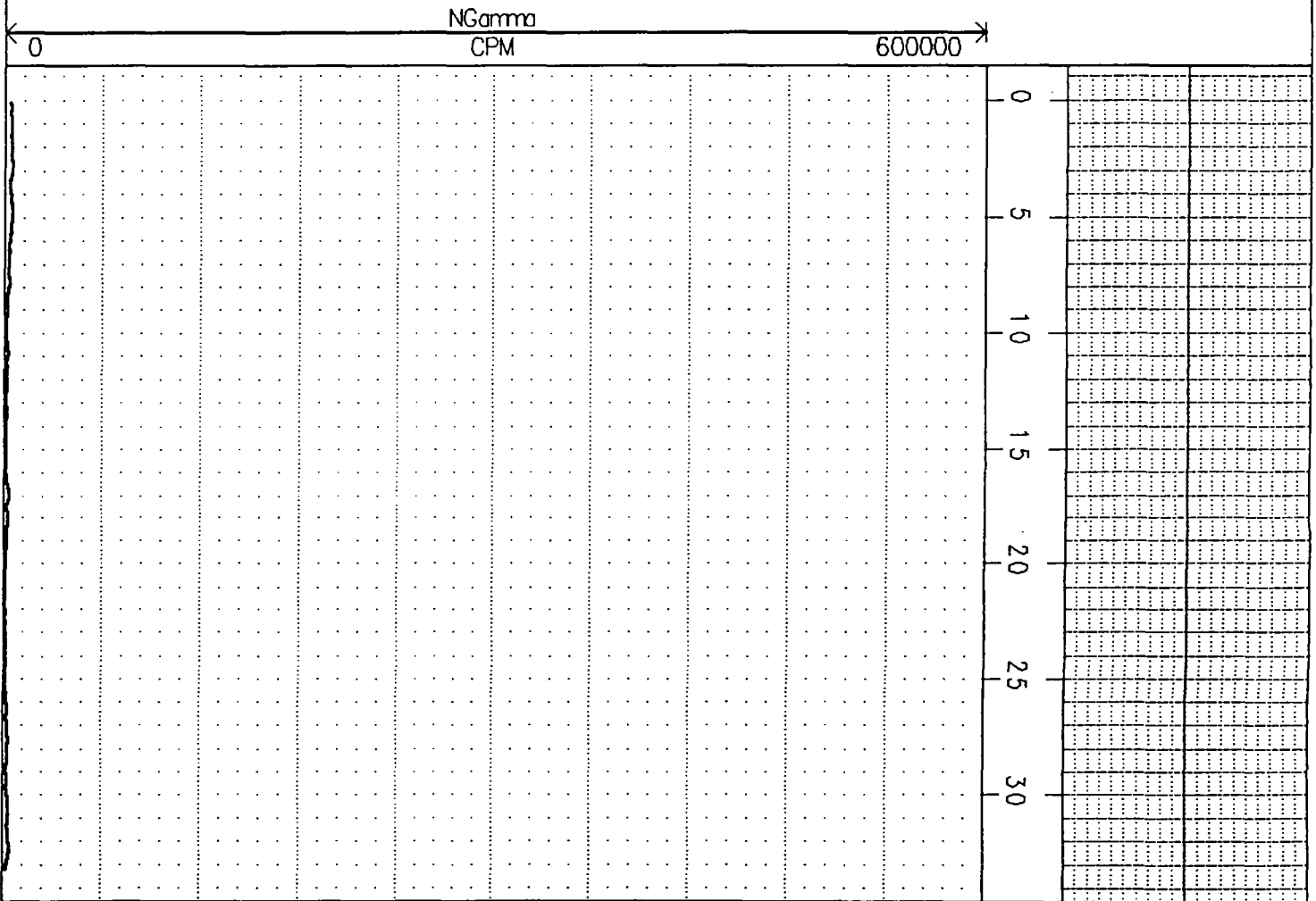


(C:\WESTLAKE\WL235.GB0)

COLOG

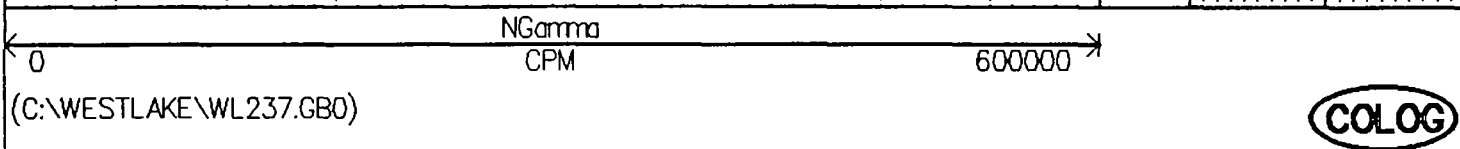
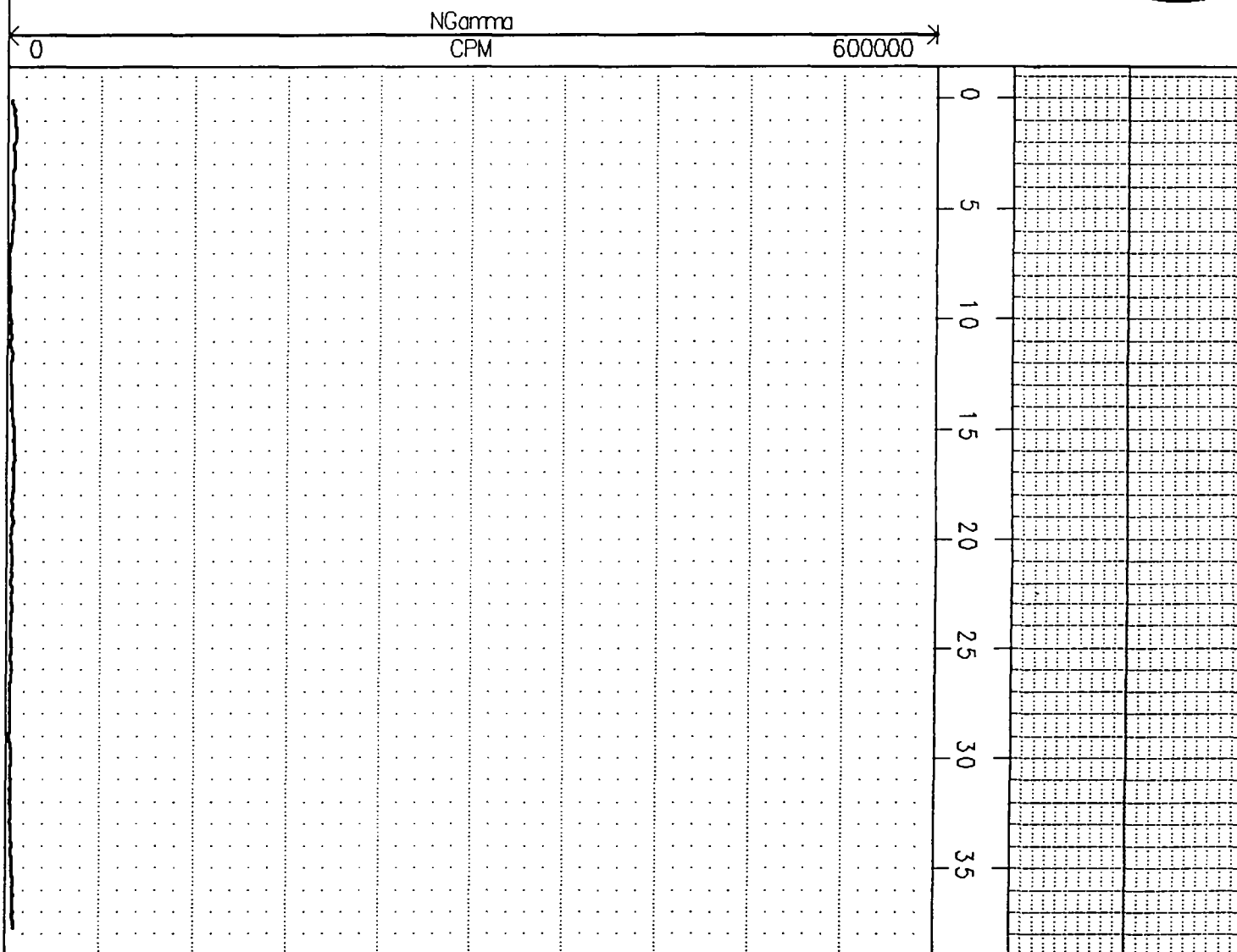
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COLOG



(C:\WESTLAKE\WL237.GB0)

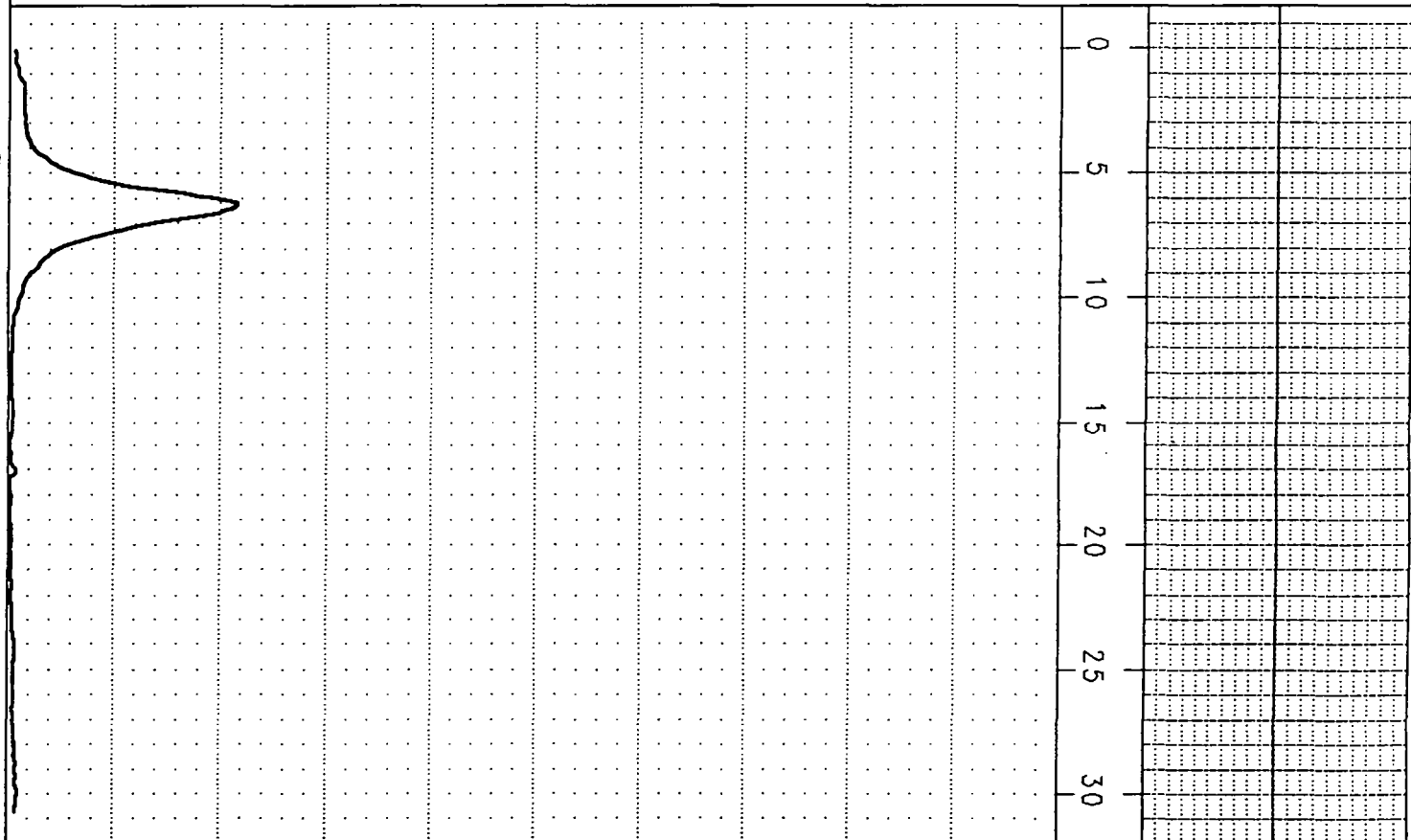
COLOG



(C:\WESTLAKE\WL238.GB0)

COLOG

← 0 NGamma CPM 600000 →



← 0 NGamma CPM 600000 →

(C:\WESTLAKE\WL238.GB0)

COLOG

(C:\WESTLAKE\WL239.GB0)

COLOG

NGamma
CPM

0

600000

0

5

10

15

20

NGamma
CPM

0

600000

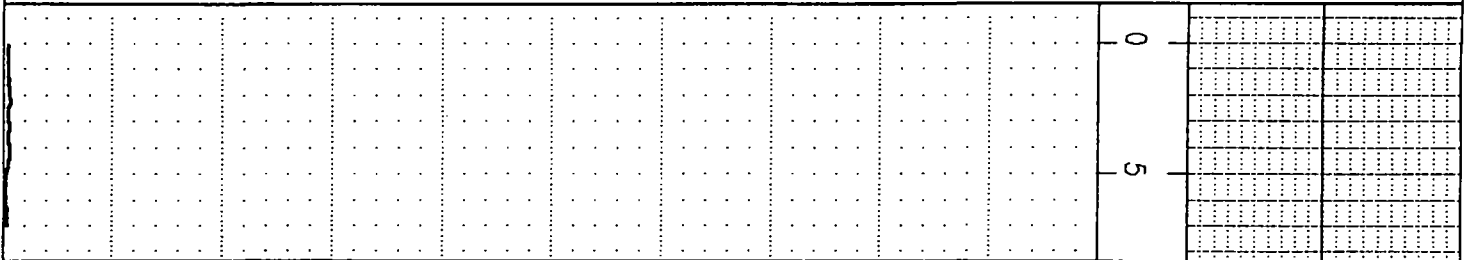
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COLOG

(C:\WESTLAKE\WL240.GB0)

COLOG

← 0 NGamma CPM 600000 →



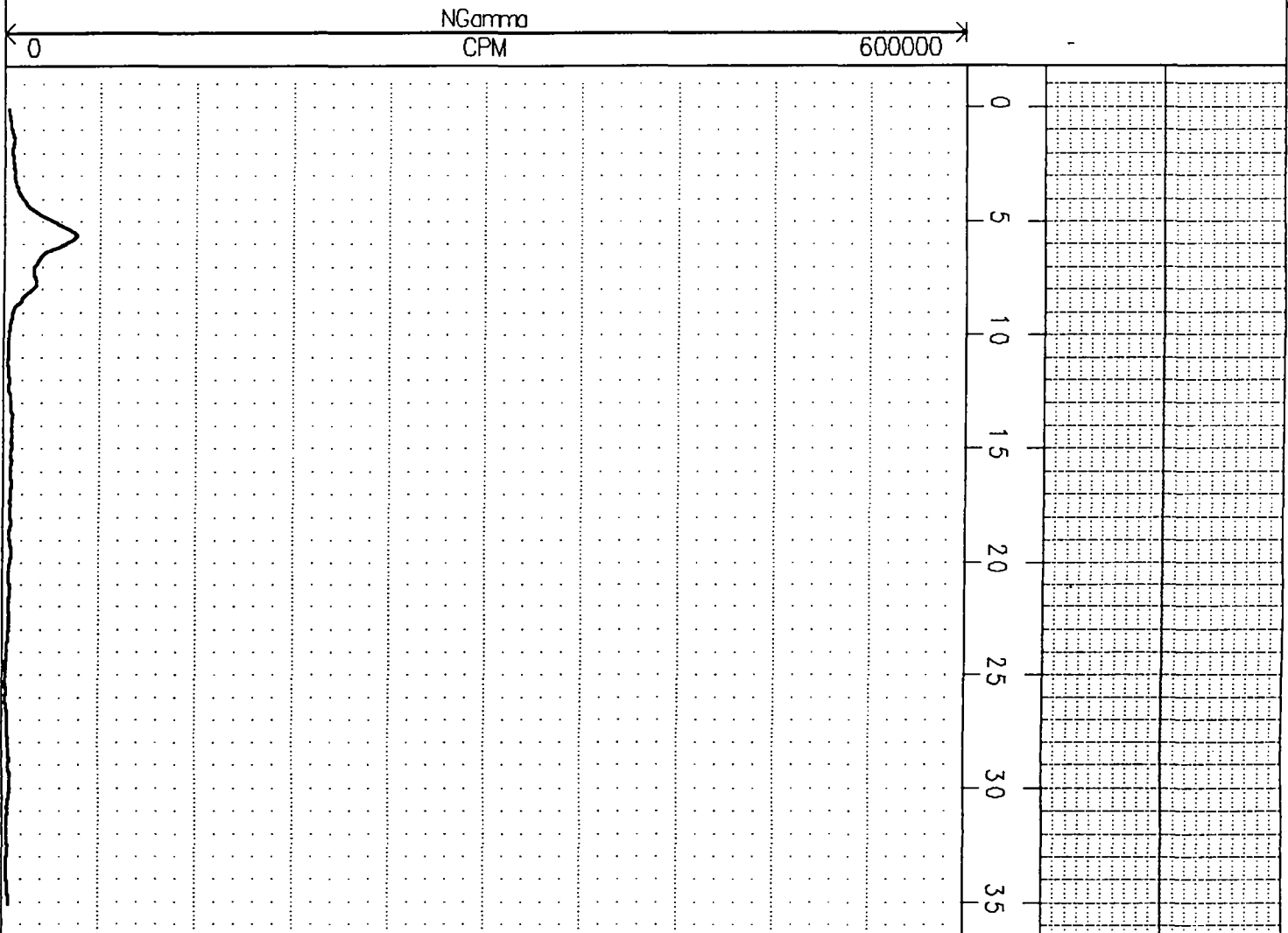
← 0 NGamma CPM 600000 →

(C:\WESTLAKE\WL240.GB0)

COLOG

(C:\WESTLAKE\WL241.GB0)

COLOG



NGamma CPM

0 600000

(C:\WESTLAKE\WL241.GB0)

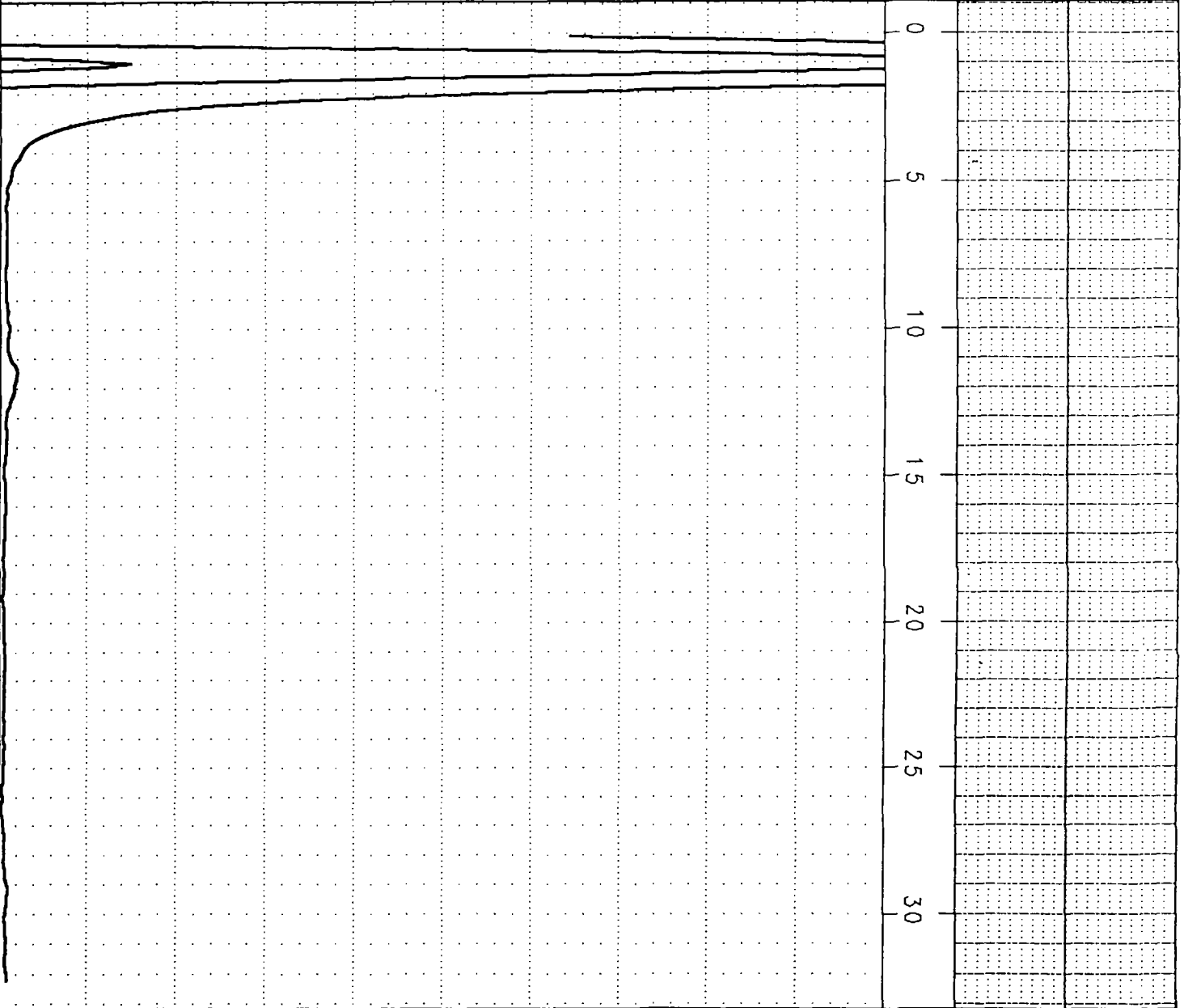
COLOG

**PVC Boring
Downhole Gamma Logs**

(C:\WESTLAKE\PVC4.GB0)

COLOG

NGamma
CPM 0 600000



NGamma
CPM 0 600000

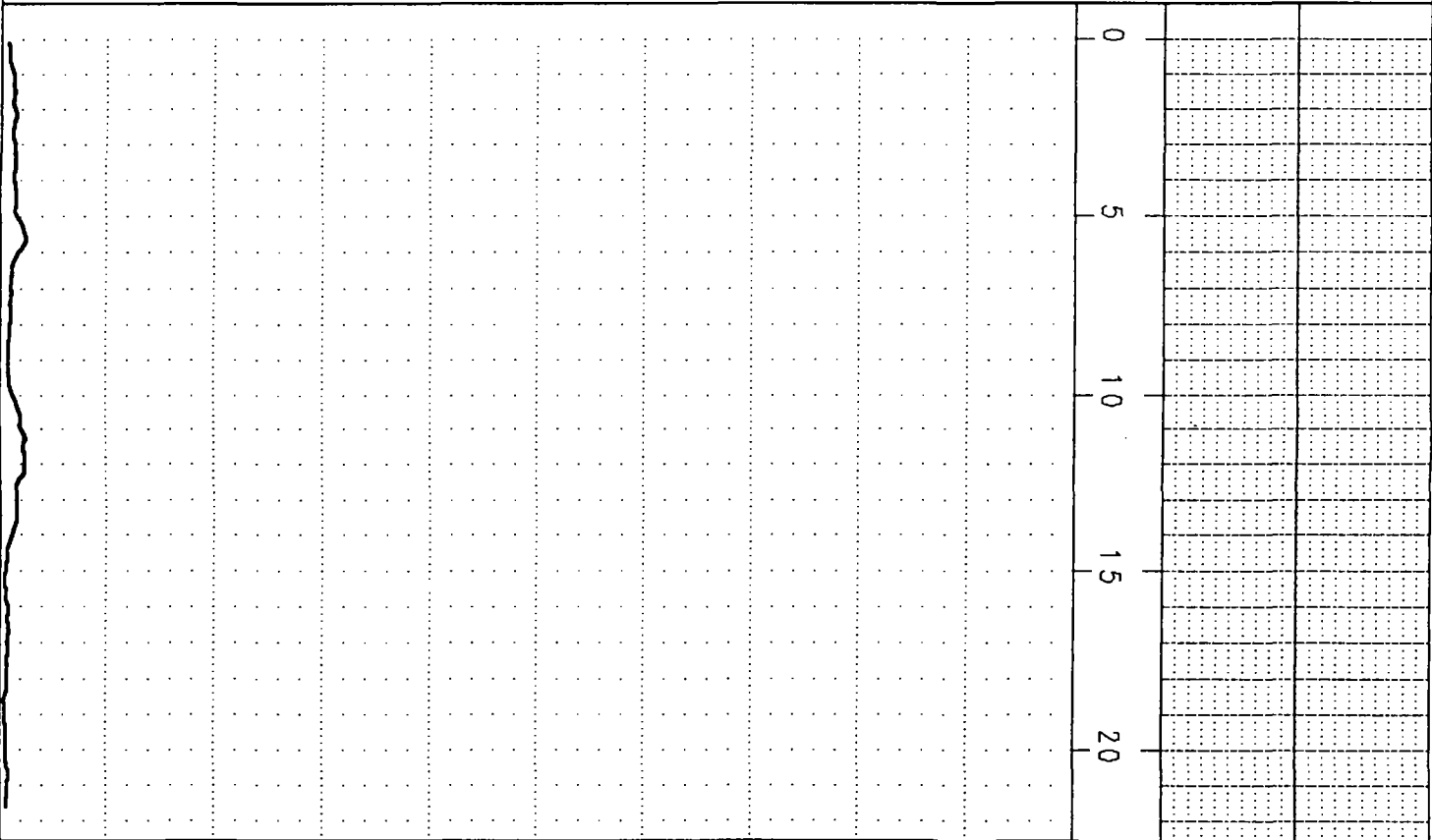
(C:\WESTLAKE\PVC4.GB0)

COLOG

(C:\WESTLAKE\PVC5.GB0)

COLOG

0 NGamma CPM 600000



0 NGamma CPM 600000

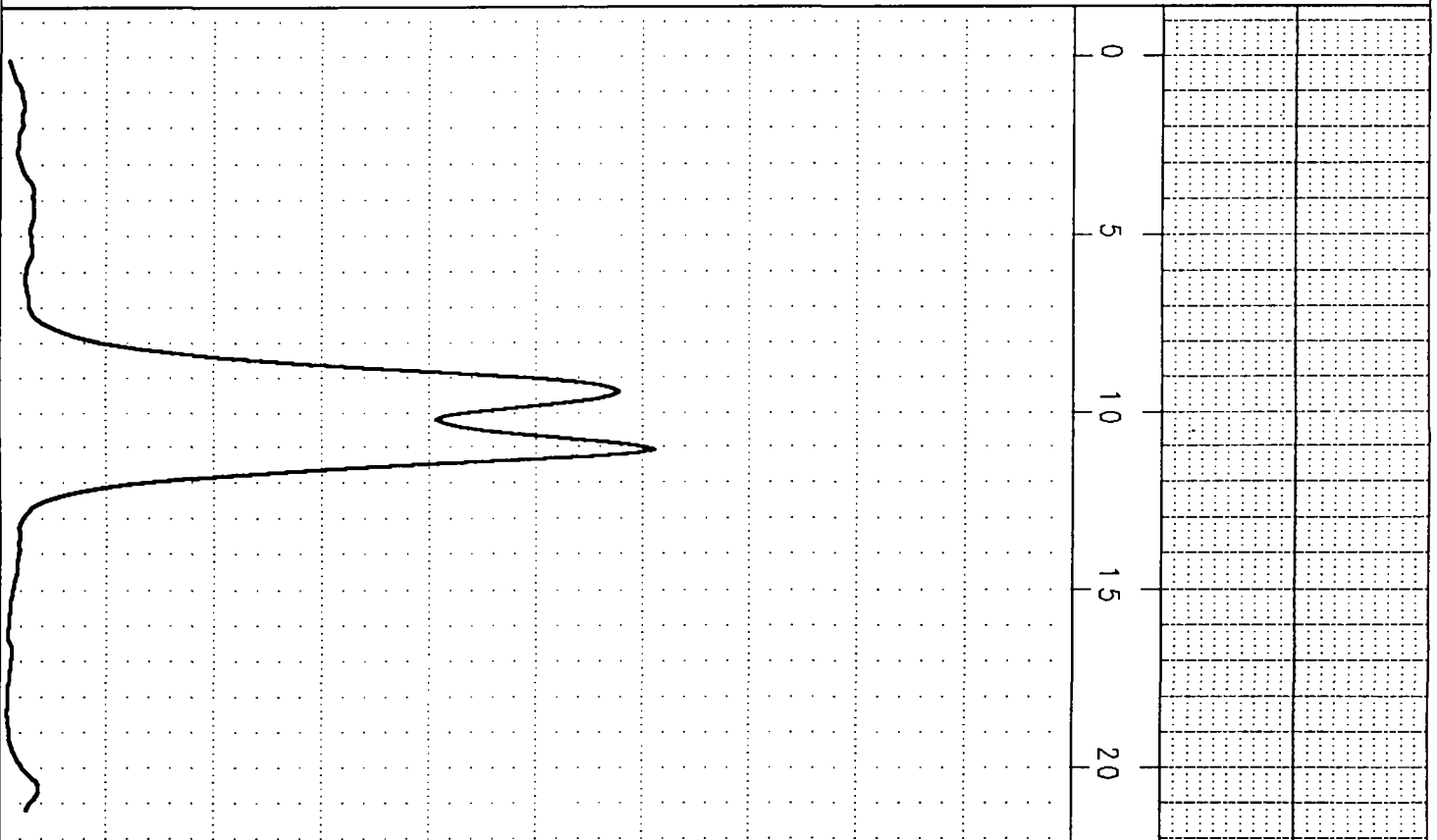
(C:\WESTLAKE\PVC5.GB0)

COLOG

(C:\WESTLAKE\PVC6.GB0)

COLOG

← 0 NGamma CPM 600000 →



← 0 NGamma CPM 600000 →

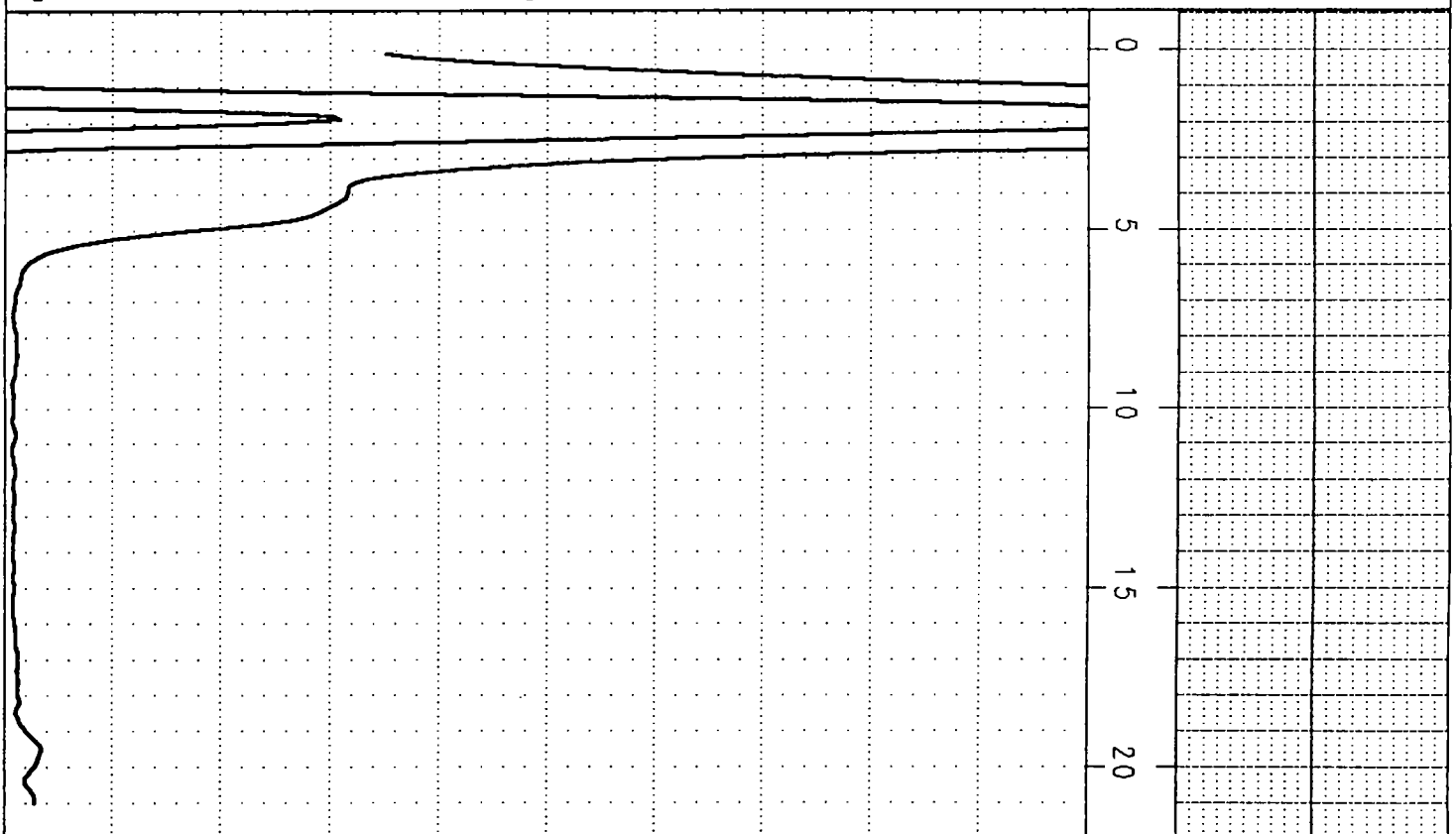
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COLOG

(C:\WESTLAKE\PVC7.GB0)

COLOG

0 NGamma CPM 600000



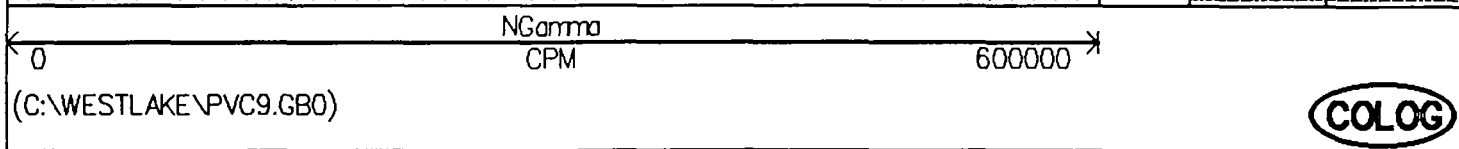
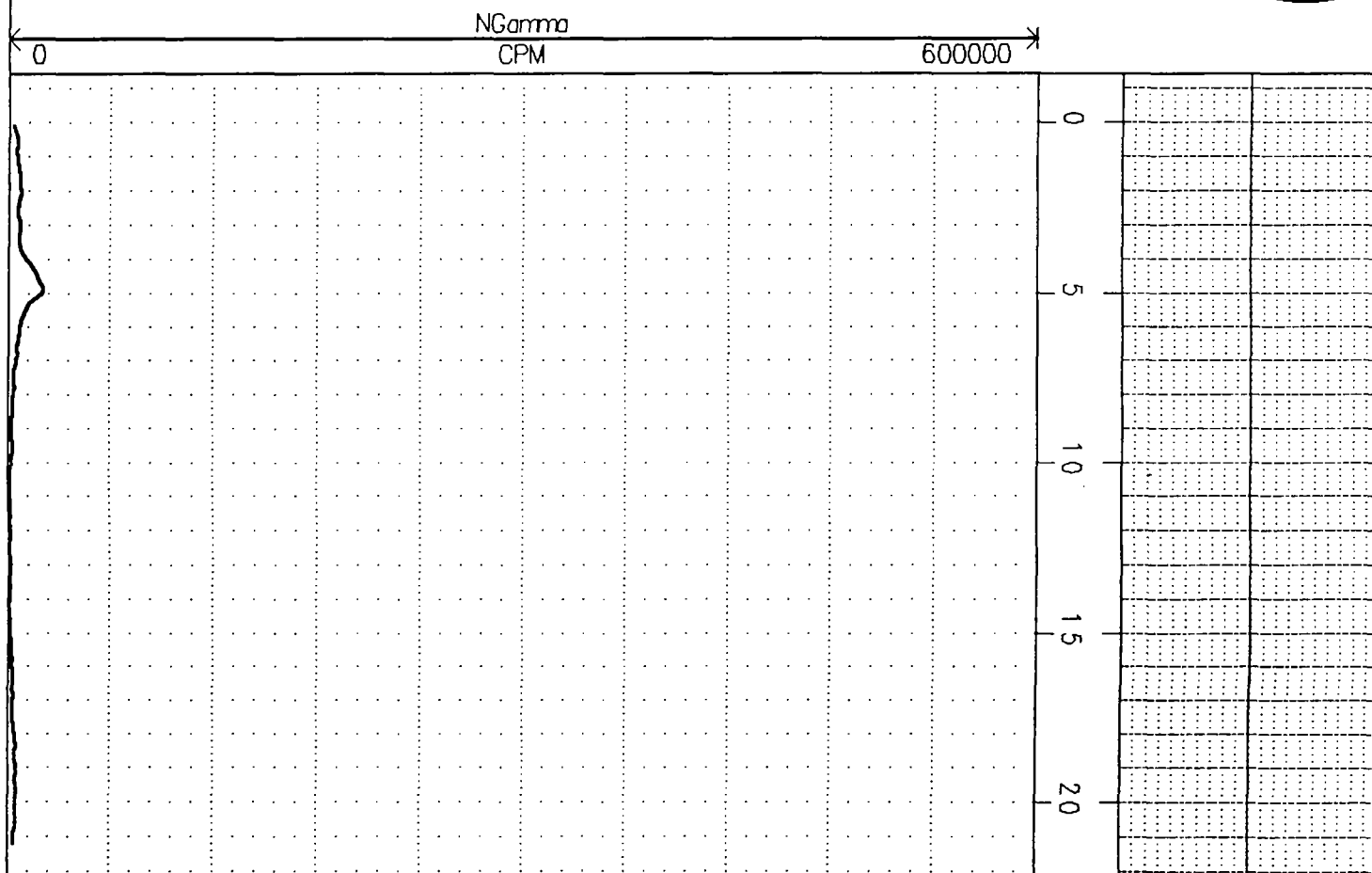
0 NGamma CPM 600000

(C:\WESTLAKE\PVC7.GB0)

COLOG

(C:\WESTLAKE\PVC9.GB0)

COLOG



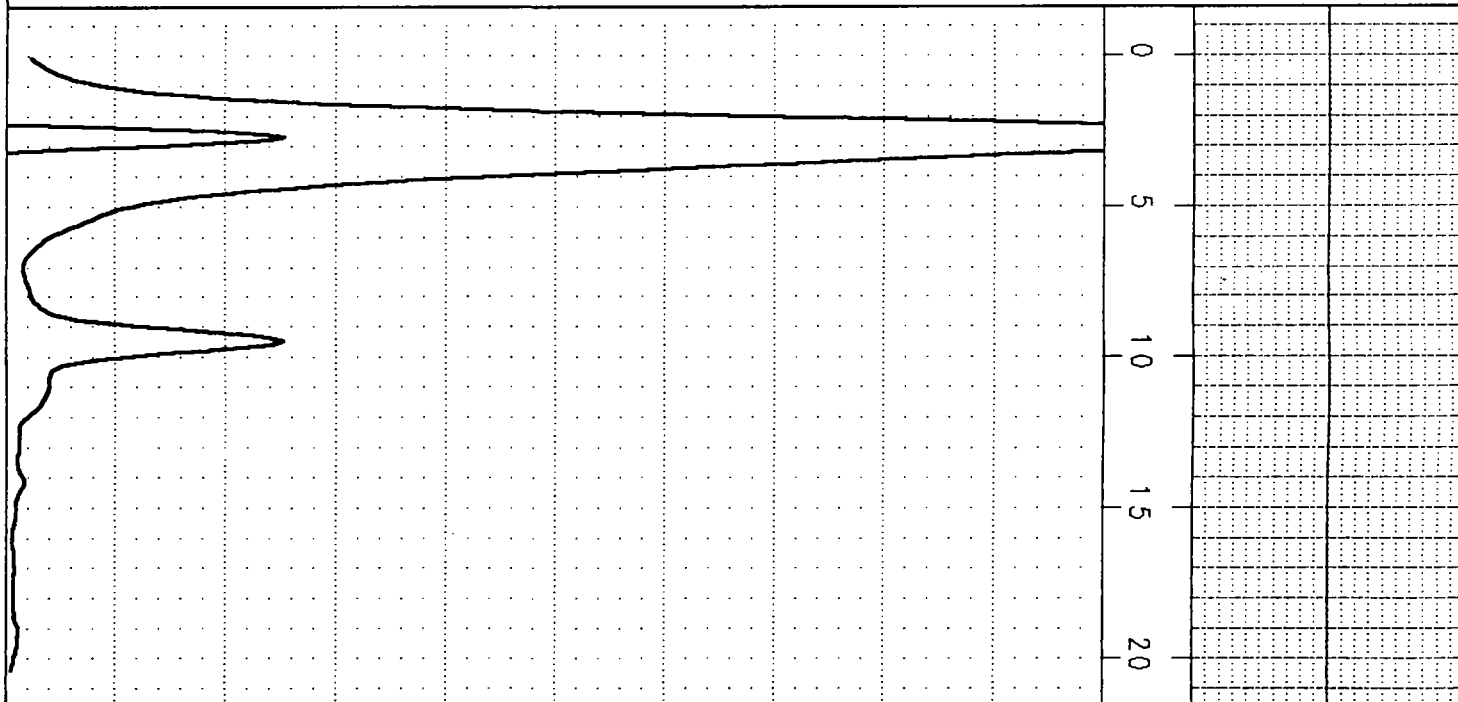
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COLOG

(C:\WESTLAKE\PVC1 0.GB0)

COLOG

0 NGamma CPM 600000



0 NGamma CPM 600000

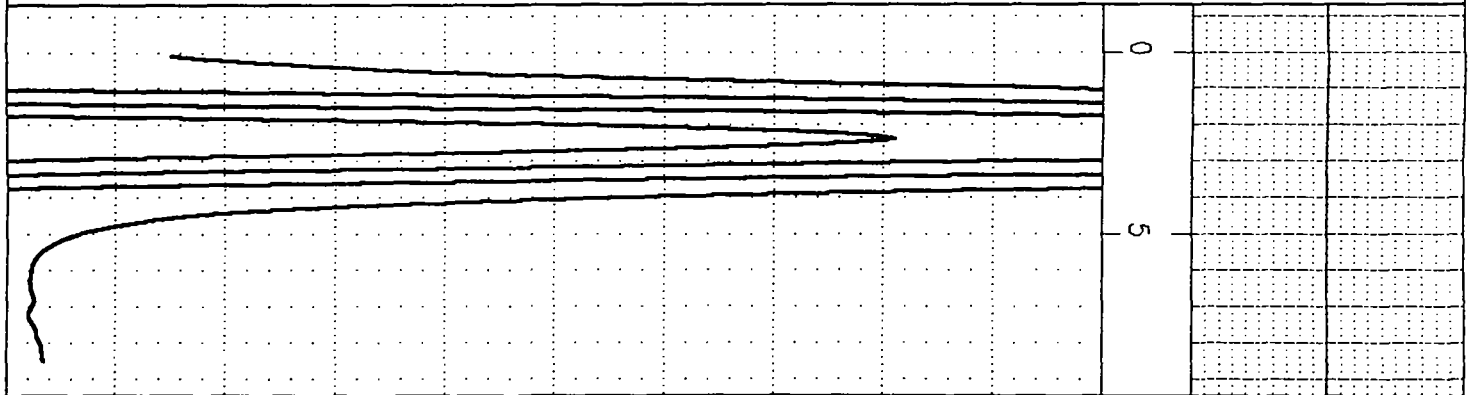
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COLOG

(C:\WESTLAKE\PVC11 A.GB0)

COLOG

← 0 NGamma CPM 600000 →



← 0 NGamma CPM 600000 →

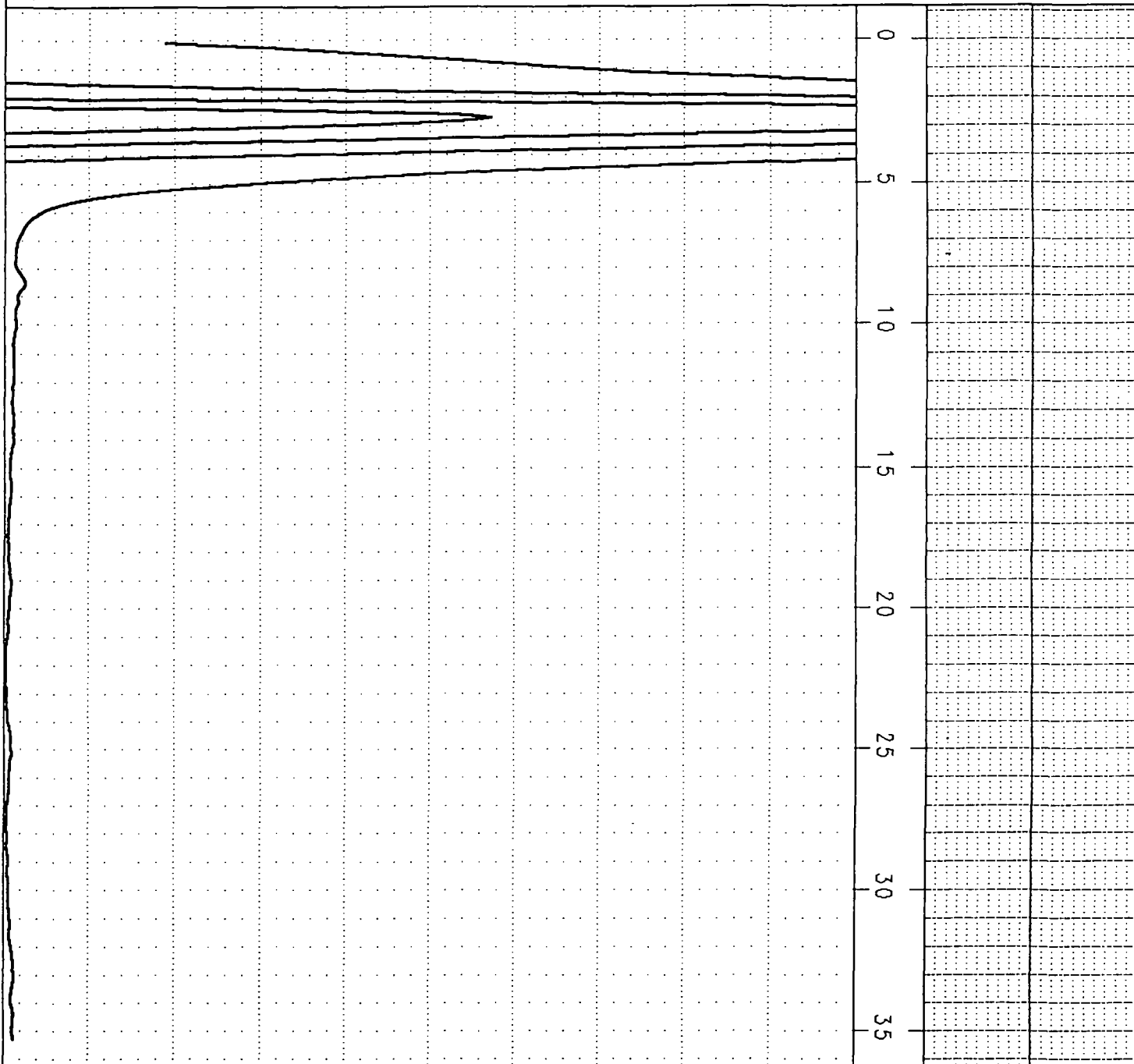
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COLOG

(C:\WESTLAKE\PVC11B.GB0)

COLOG

← 0 NGamma CPM 600000 →



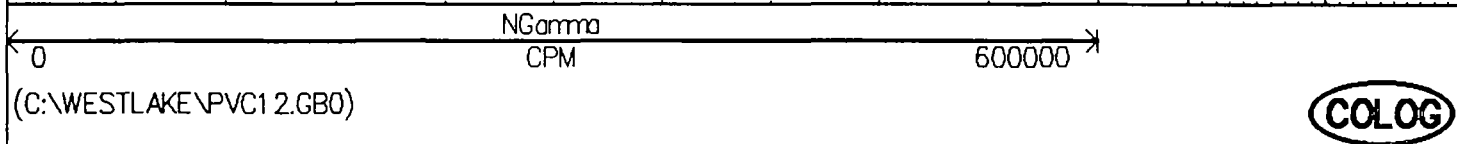
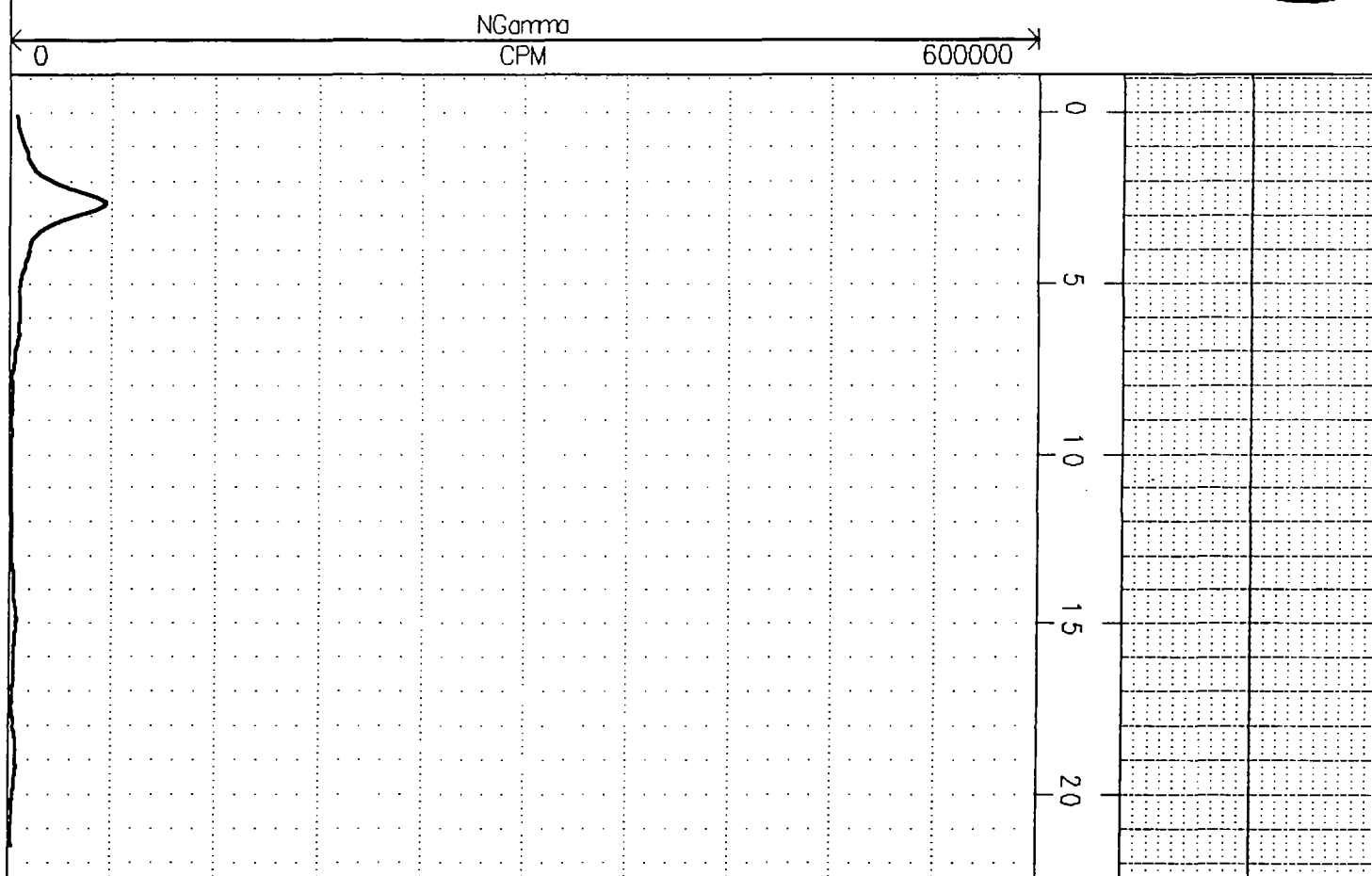
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(C:\WESTLAKE\PVC11B.GB0)

COLOG

(C:\WESTLAKE\PVC1 2.GB0)

COLOG



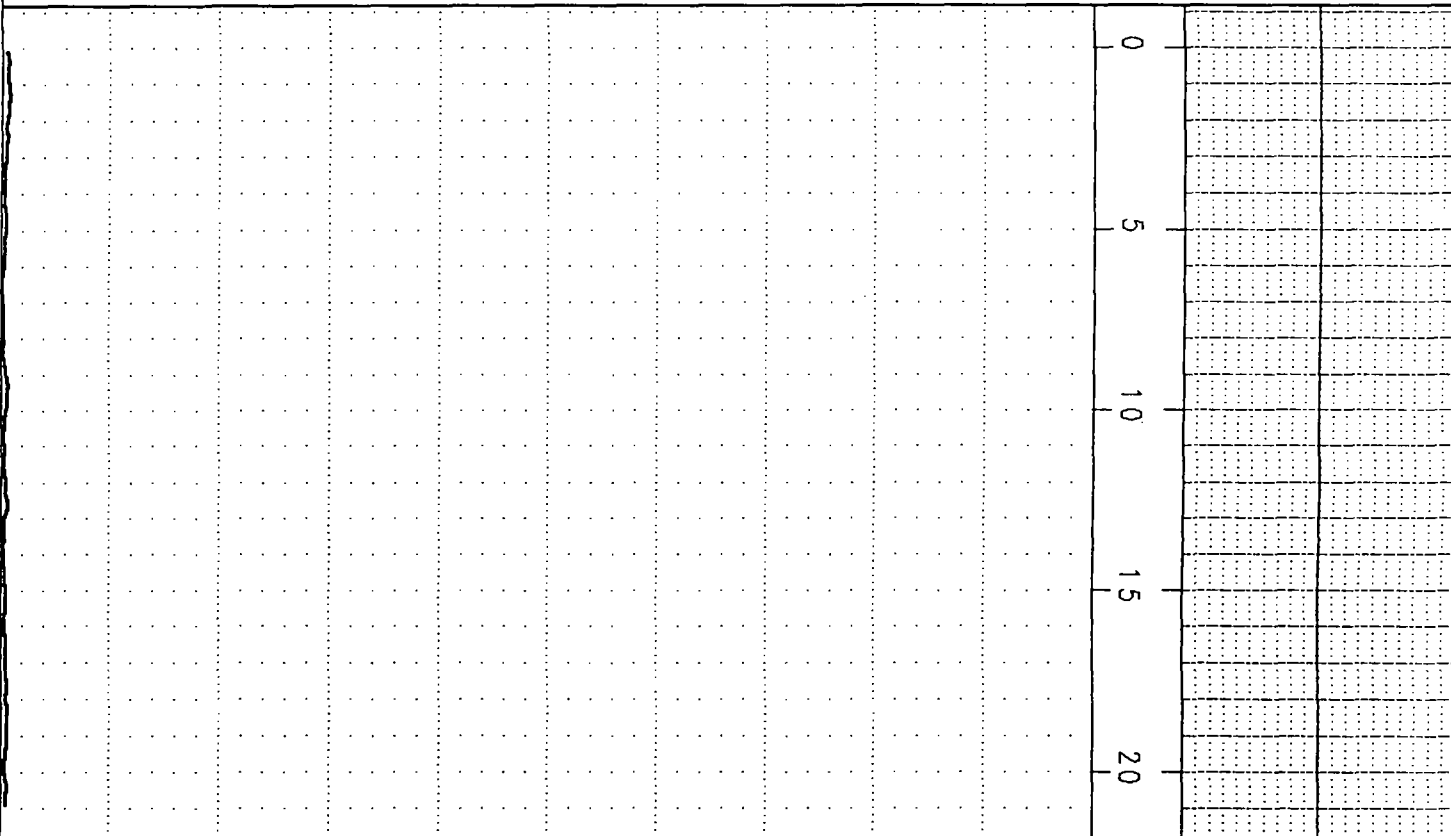
(C:\WESTLAKE\PVC1 2.GB0)

COLOG

(C:\WESTLAKE\PVC1 3.GB0)

COLOG

← 0 NGamma CPM 600000 →



← 0 NGamma CPM 600000 →

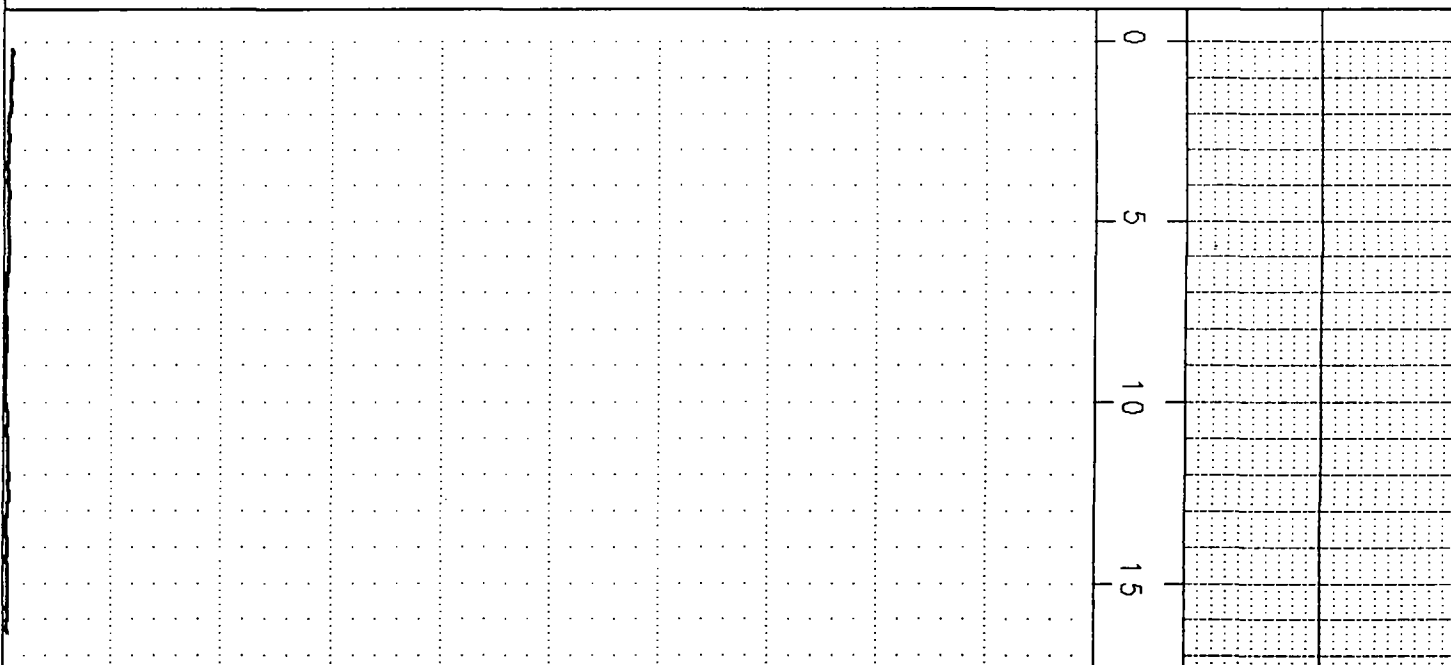
(C:\WESTLAKE\PVC1 3.GB0)

COLOG

(C:\WESTLAKE\PVC1 8.GB0)

COLOG

← 0 NGamma CPM 600000 →



← 0 NGamma CPM 600000 →

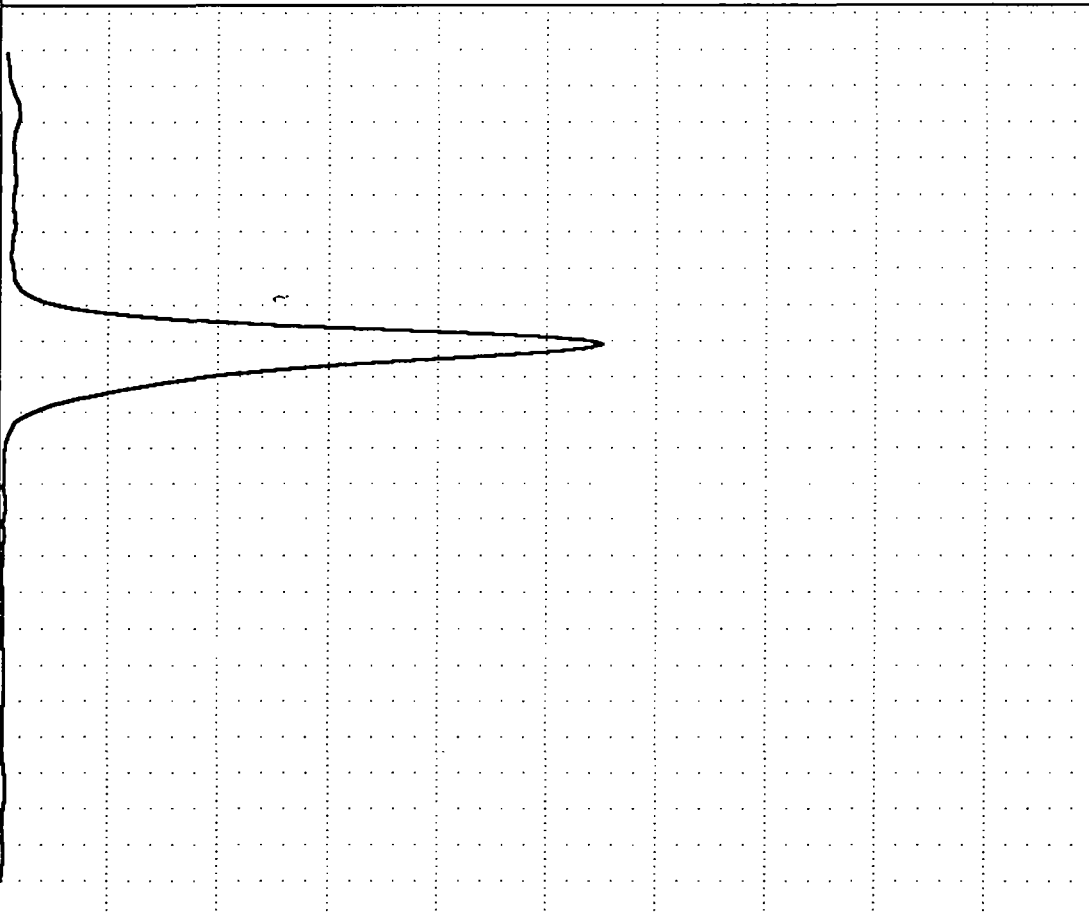
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COLOG

(C:\WESTLAKE\PVC19.GB0)

COLOG

NGamma
CPM 0 600000



NGamma
CPM 0 600000

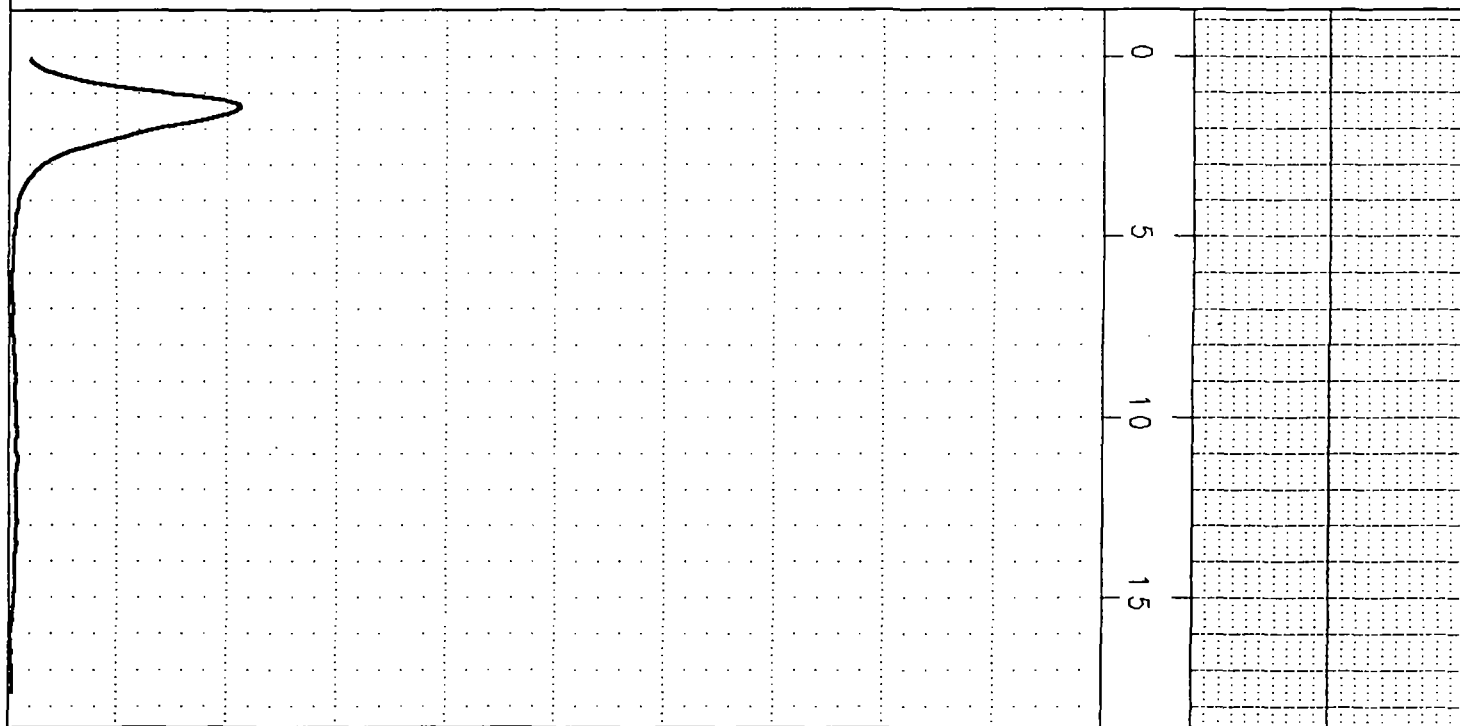
(C:\WESTLAKE\PVC19.GB0)

COLOG

(C:\WESTLAKE\PVC20.GB0)

COLOG

← 0 NGamma CPM 600000 →



← 0 NGamma CPM 600000 →

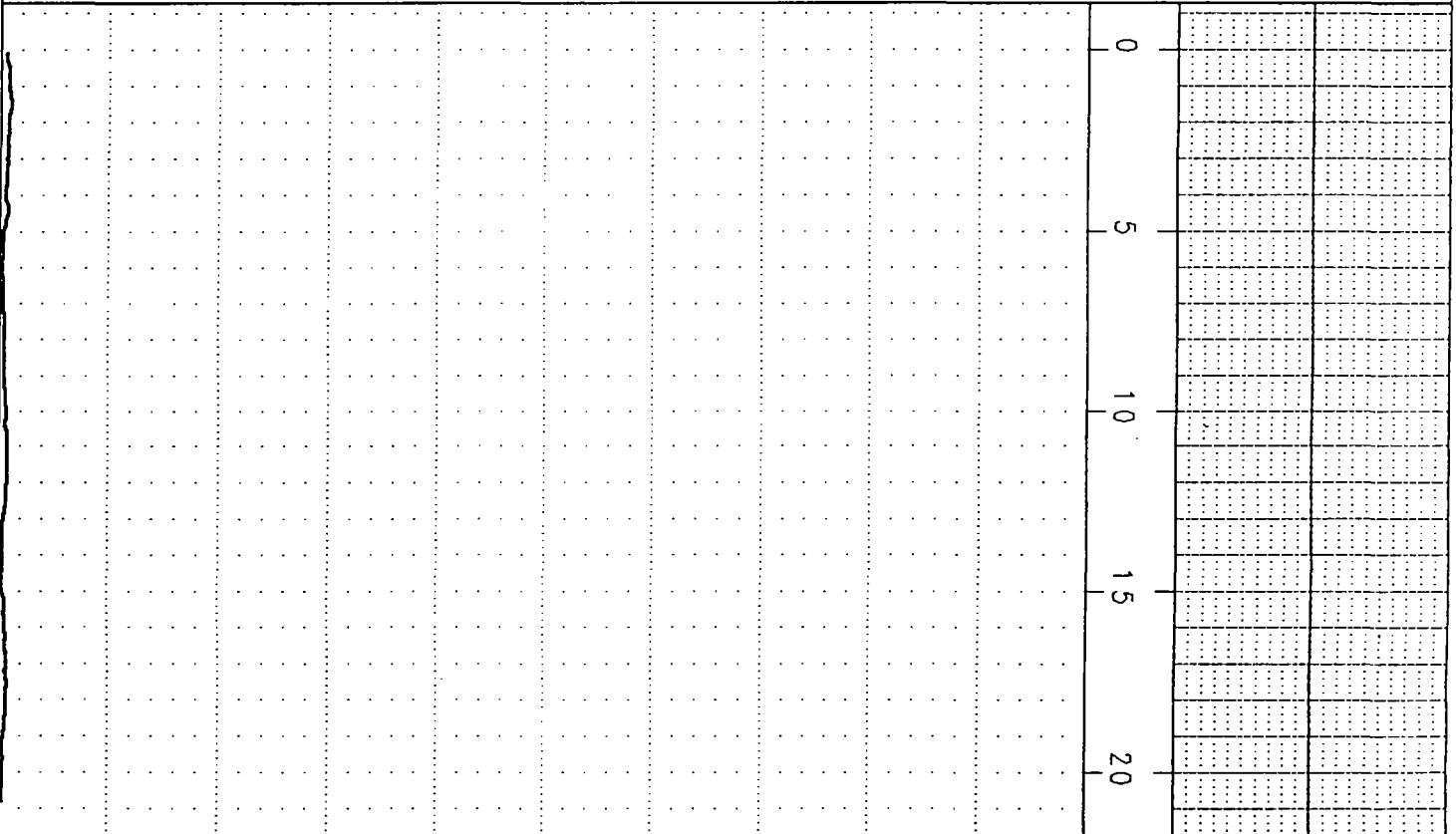
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COLOG

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COLOG

← 0 NGamma CPM 600000 →



← 0 NGamma CPM 600000 →

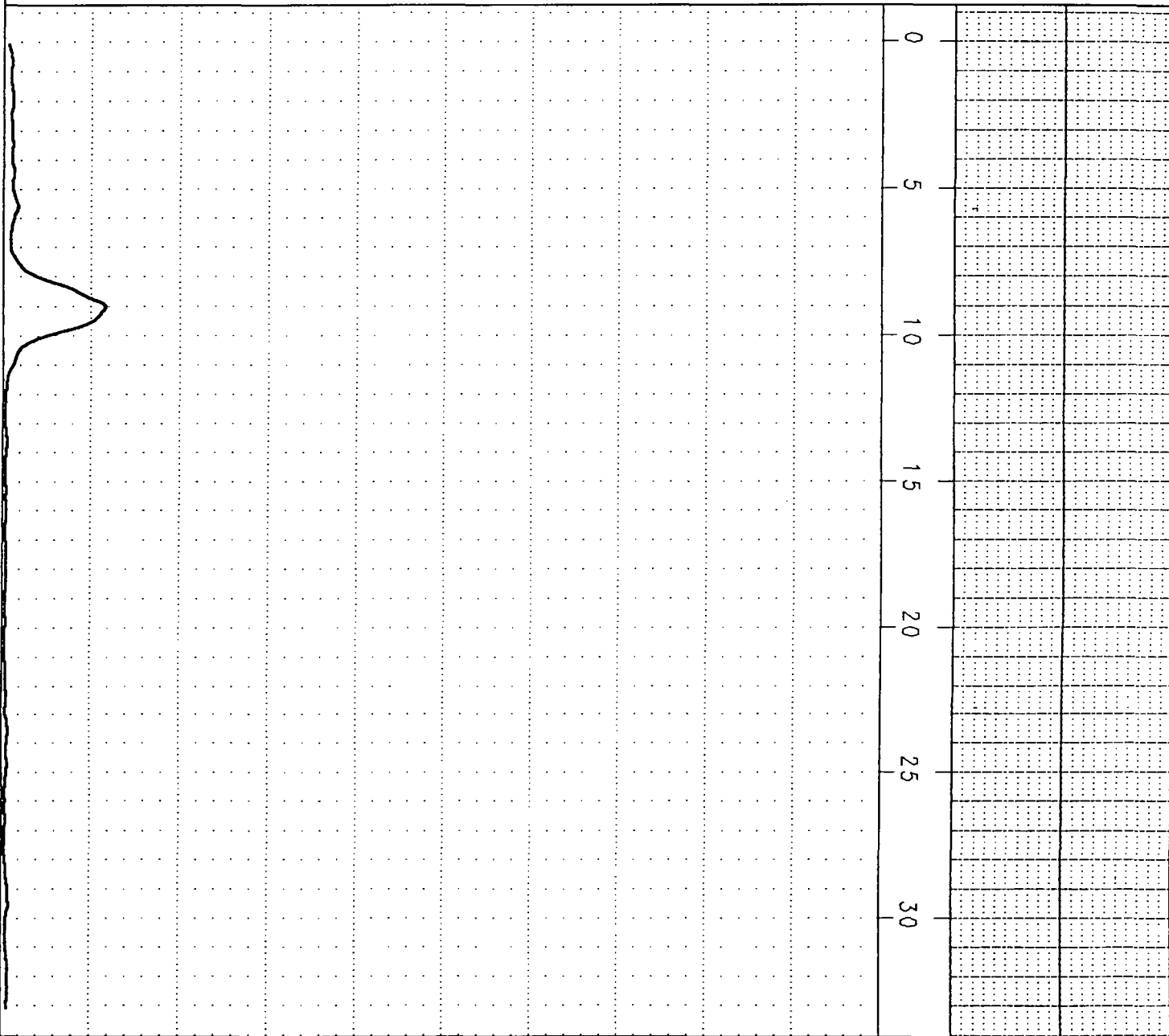
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COLOG

(C:\WESTLAKE\PVC25.GB0)

COLOG

← 0 NGamma CPM 600000 →



← 0 NGamma CPM 600000 →

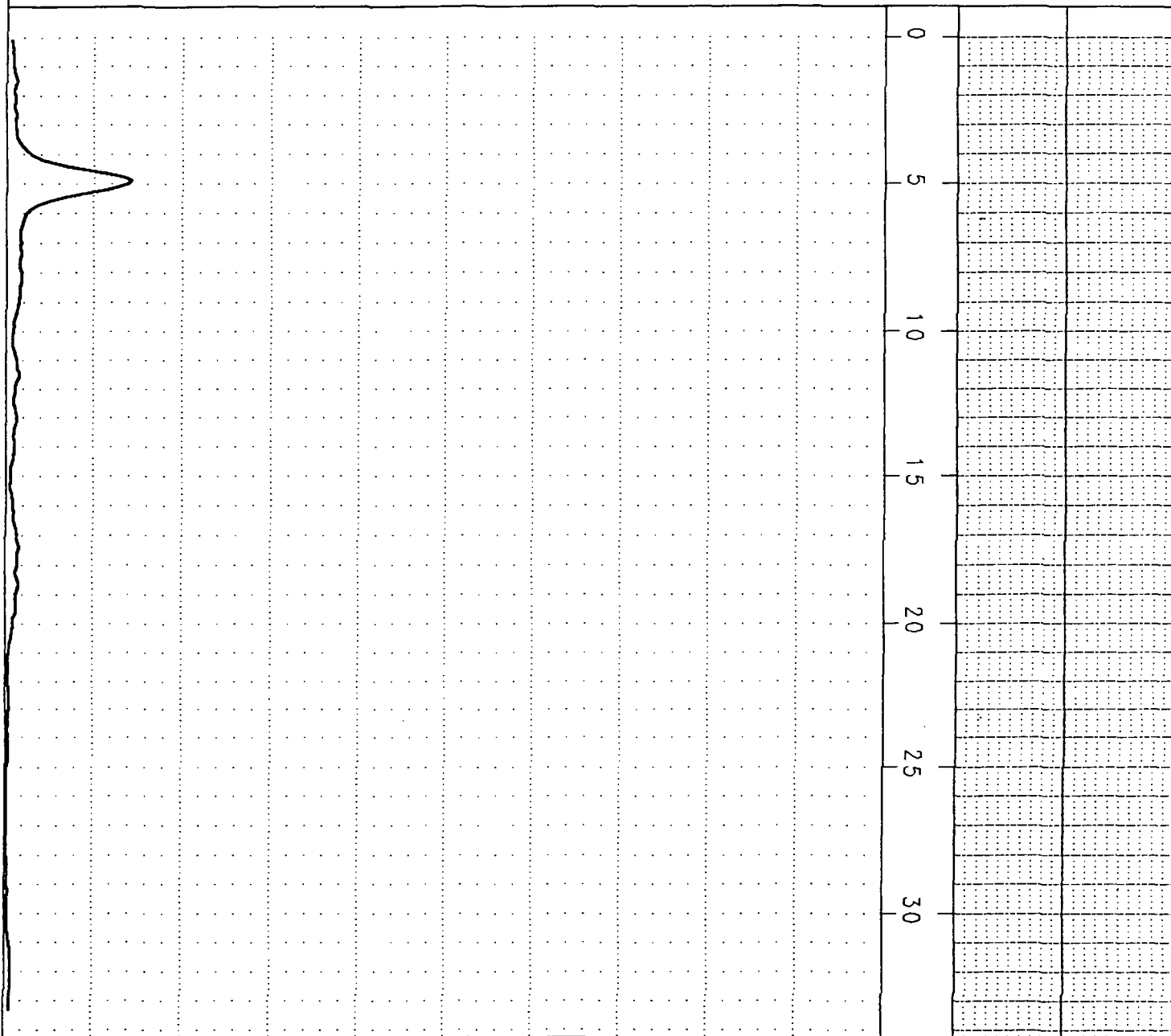
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COLOG

(C:\WESTLAKE\PVC26.GC0)

COLOG

← 0 NGamma CPM 600000 →



← 0 NGamma CPM 600000 →

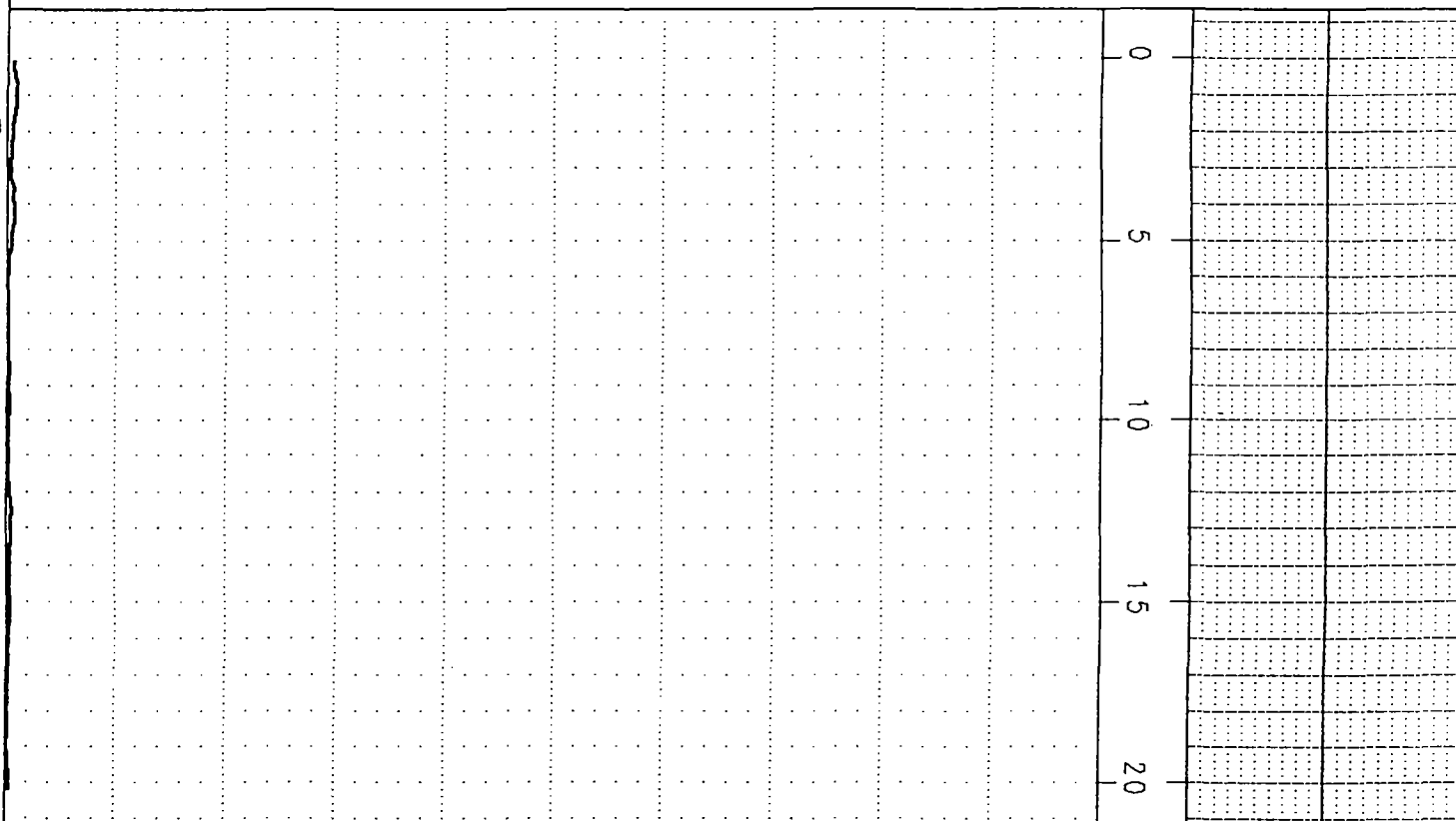
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COLOG

(C:\WESTLAKE\PVC27.GB0)

COLOG

← 0 NGamma CPM 600000 →



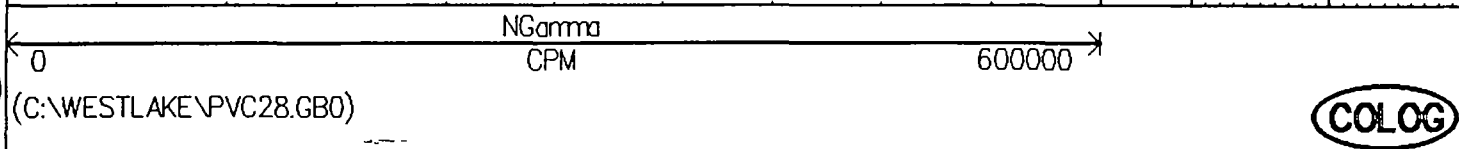
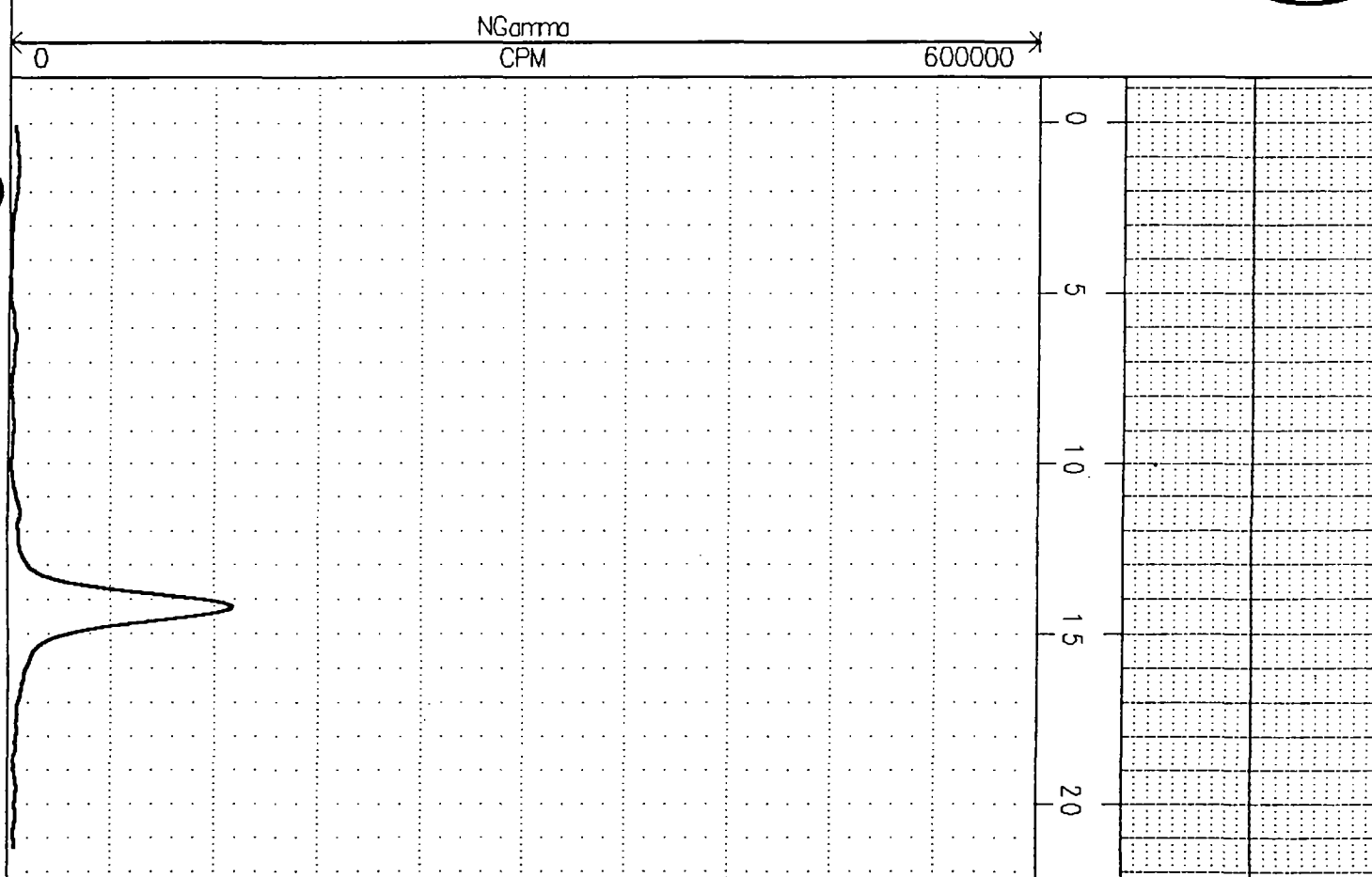
← 0 NGamma CPM 600000 →

(C:\WESTLAKE\PVC27.GB0)

COLOG

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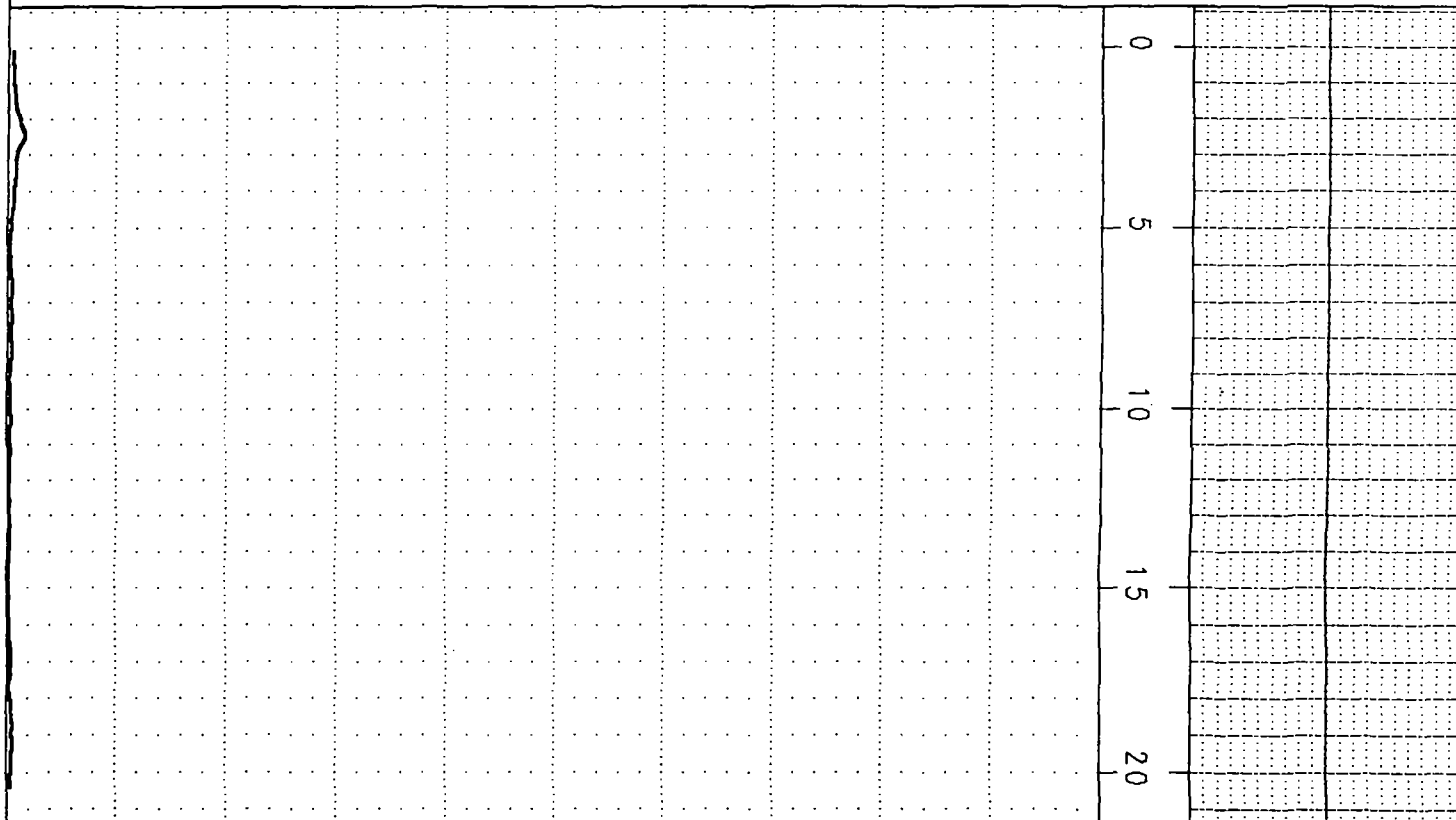
COLOG



(C:\WESTLAKE\PVC33.GB0)

COLOG

← 0 NGamma CPM 600000 →



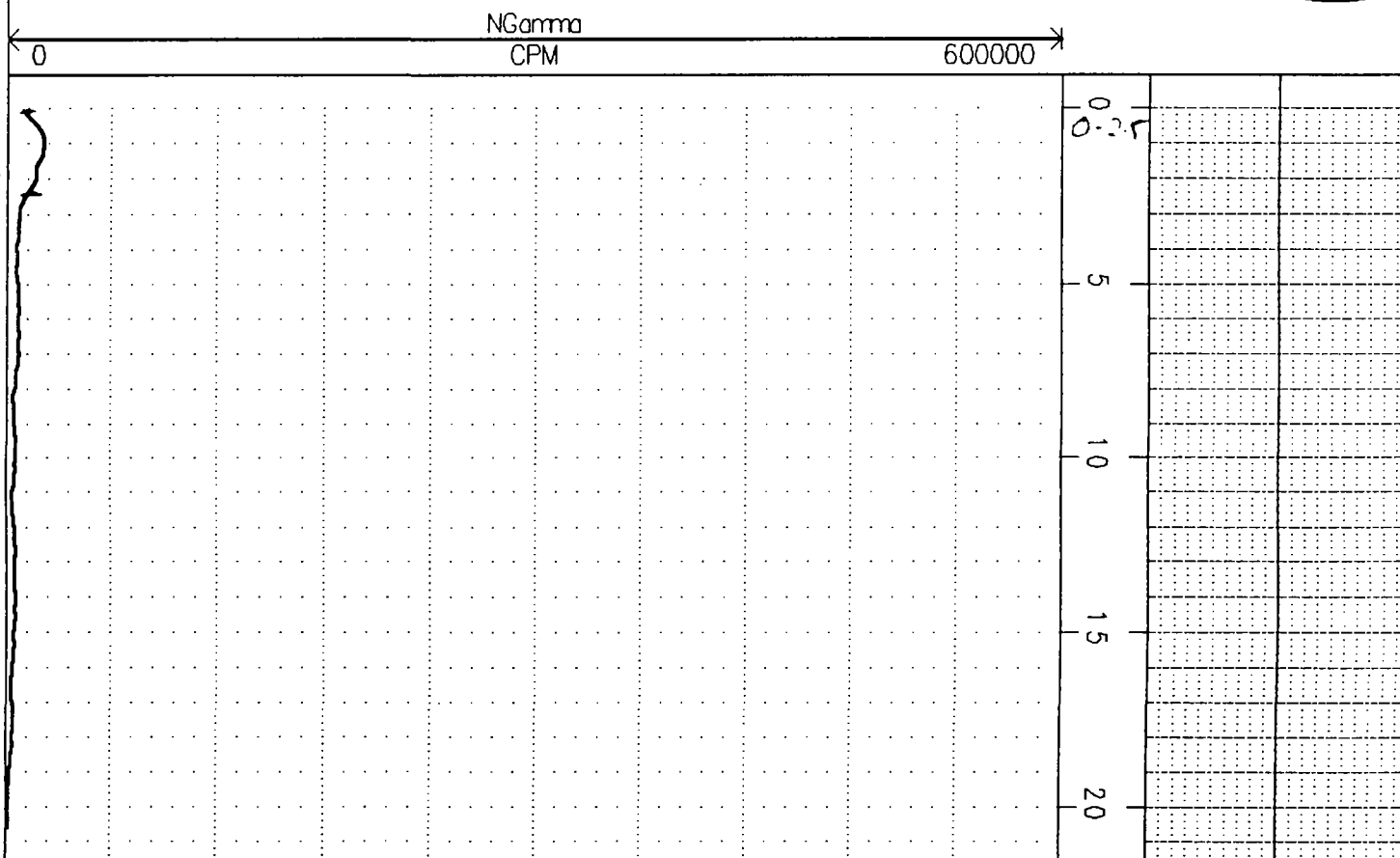
← 0 NGamma CPM 600000 →

(C:\WESTLAKE\PVC33.GB0)

COLOG

(C:\WESTLAKE\PVC34.GB0)

COLOG



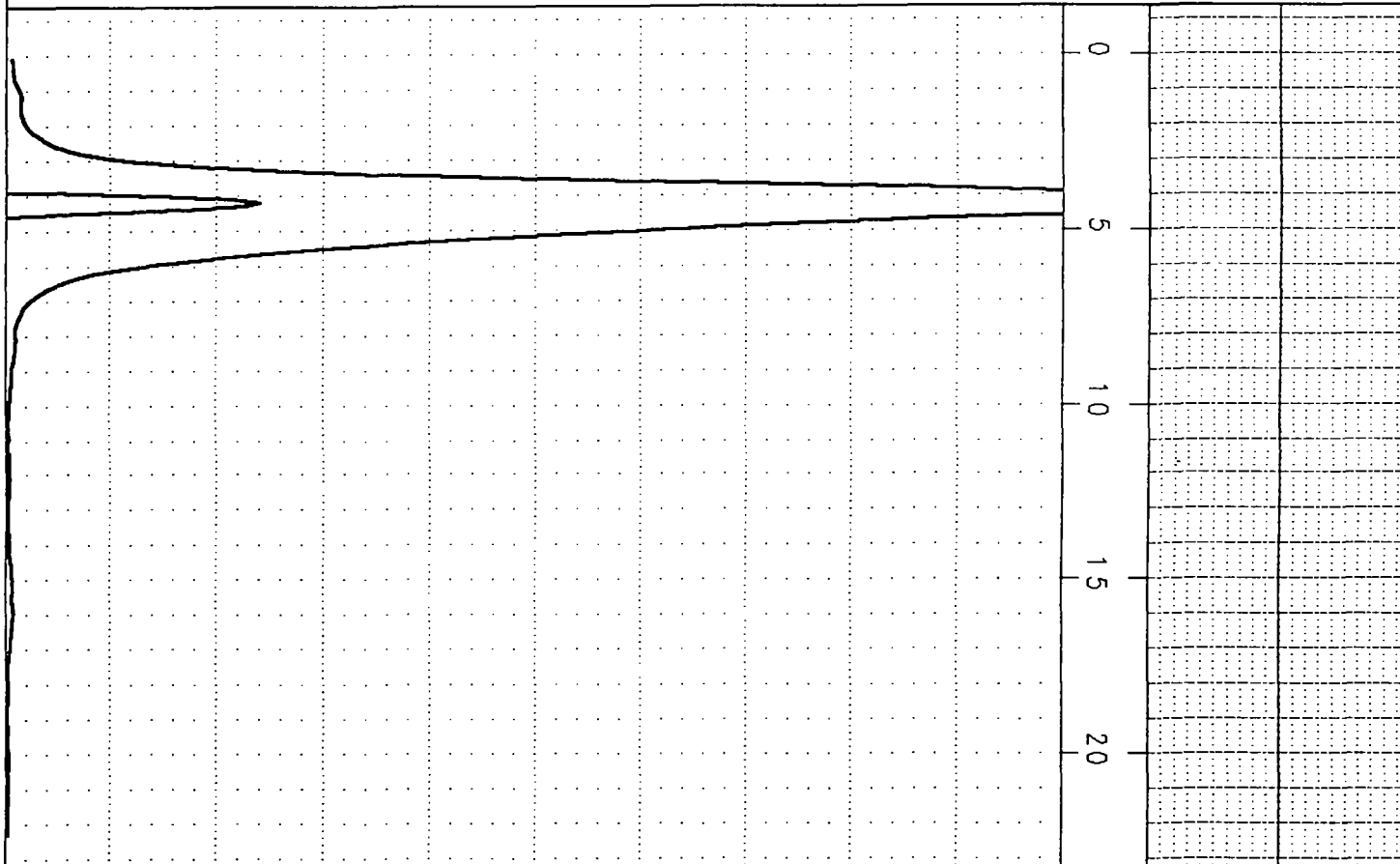
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COLOG

(C:\WESTLAKE\PVC35.GB0)

COLOG

NGamma
CPM 0 600000



NGamma
CPM 0 600000

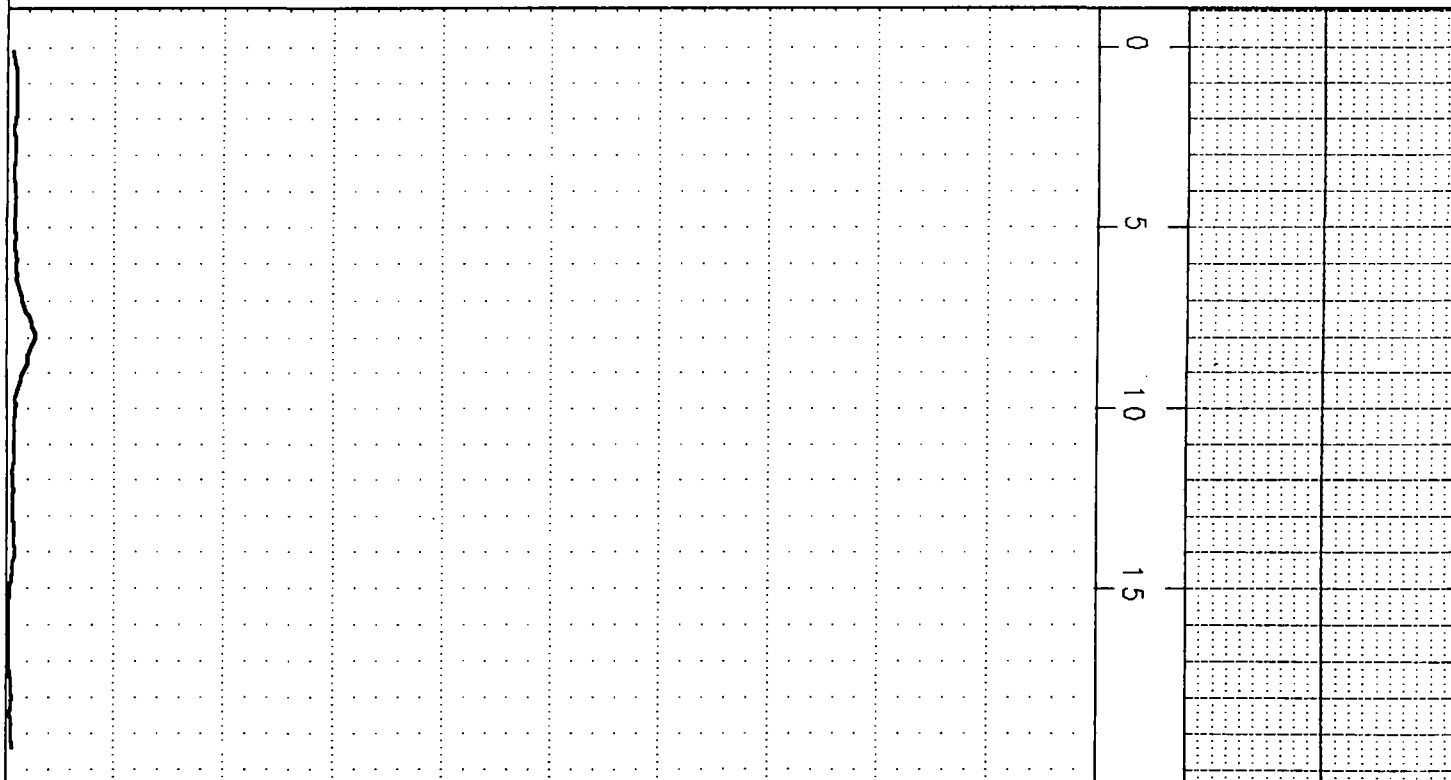
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COLOG

(C:\WESTLAKE\PVC36.GB0)

COLOG

← 0 NGamma CPM 600000 →



← 0 NGamma CPM 600000 →

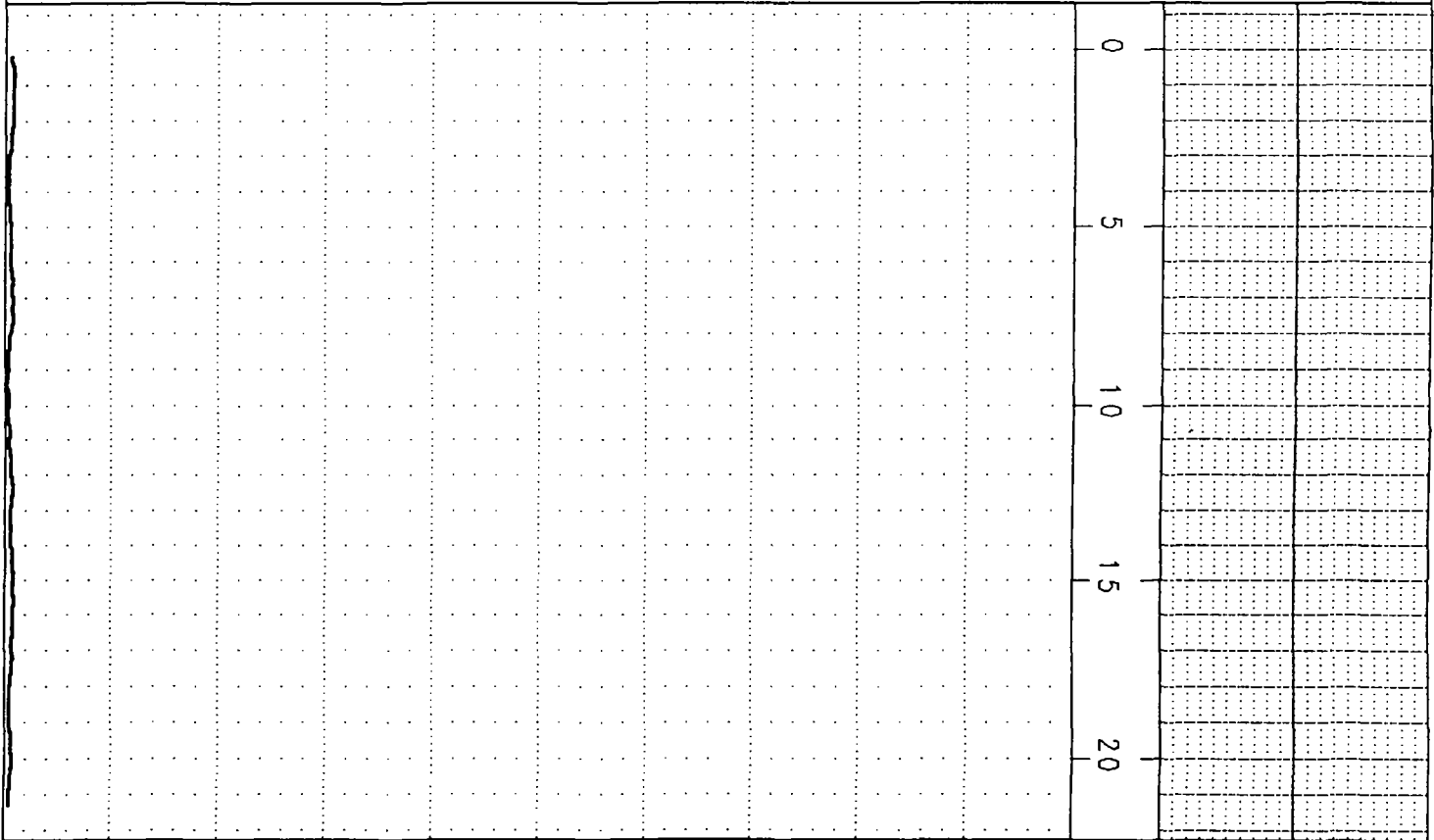
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COLOG

(C:\WESTLAKE\PVC37.GB0)

COLOG

0 NGamma CPM 600000



0 NGamma CPM 600000

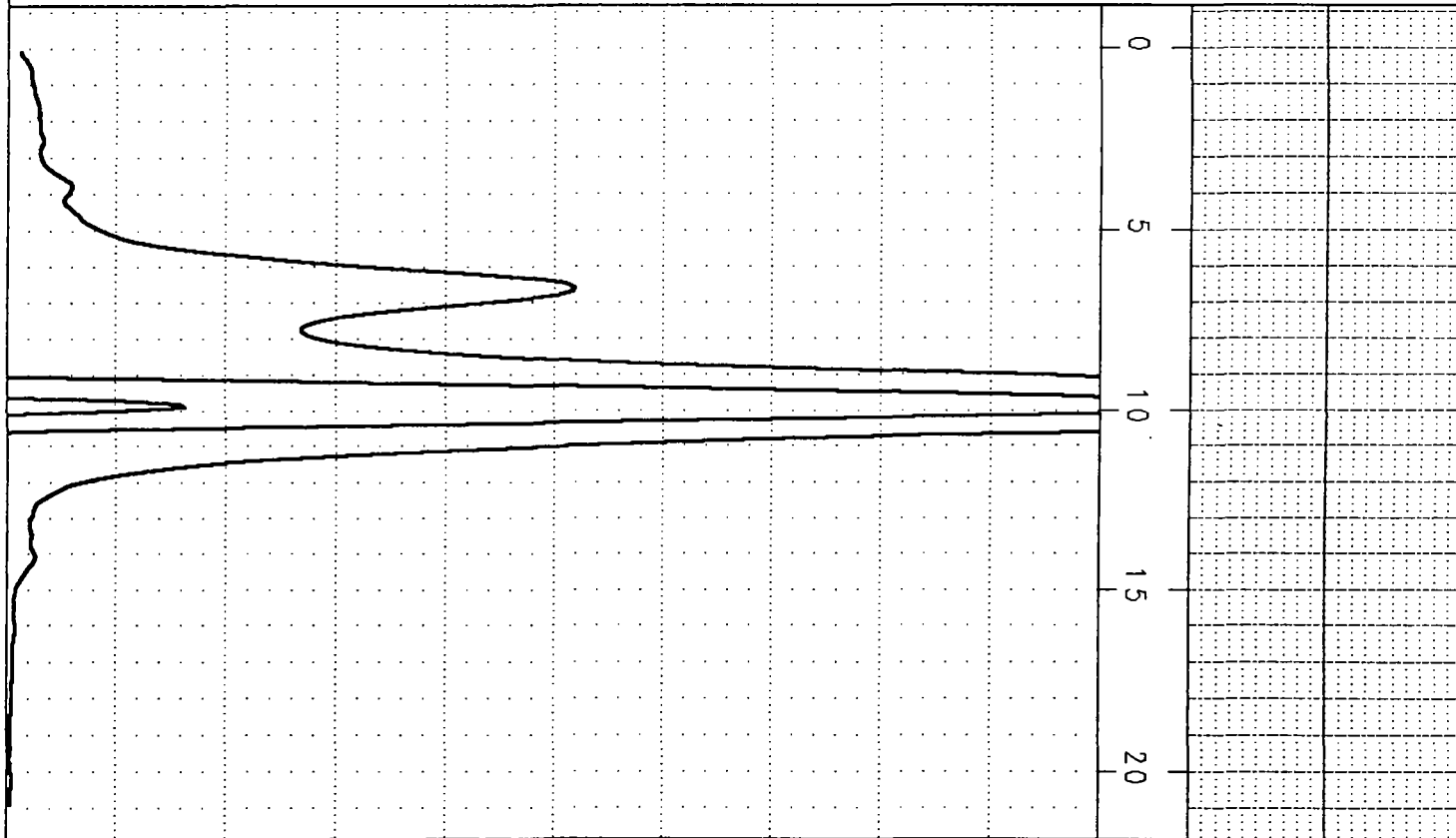
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COLOG

(C:\WESTLAKE\PVC38.GB0)

COLOG

NGamma
CPM 0 600000



NGamma
CPM 0 600000

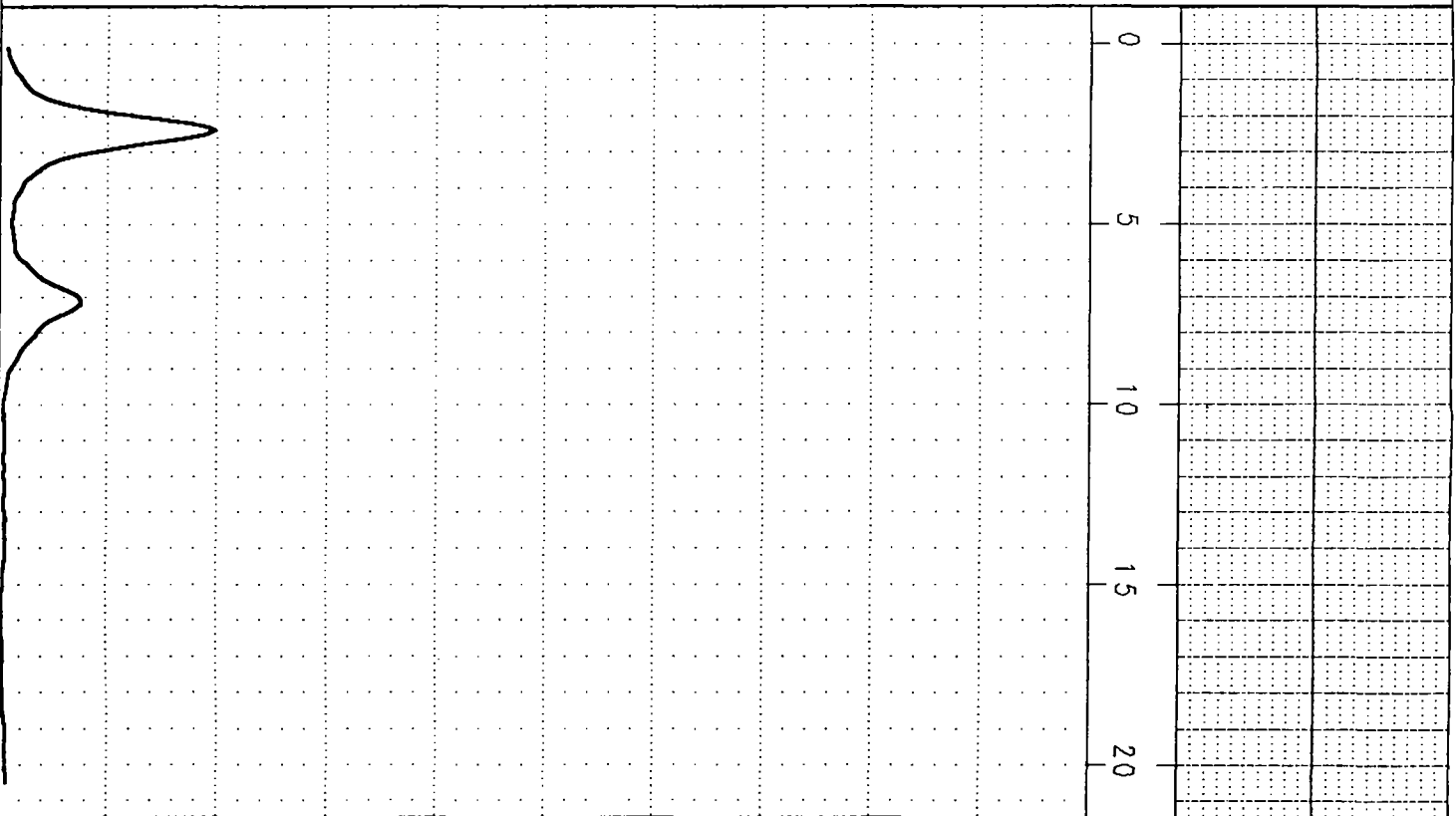
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COLOG

(C:\WESTLAKE\PVC40.GB0)

COLOG

← 0 NGamma CPM 600000 →



← 0 NGamma CPM 600000 →

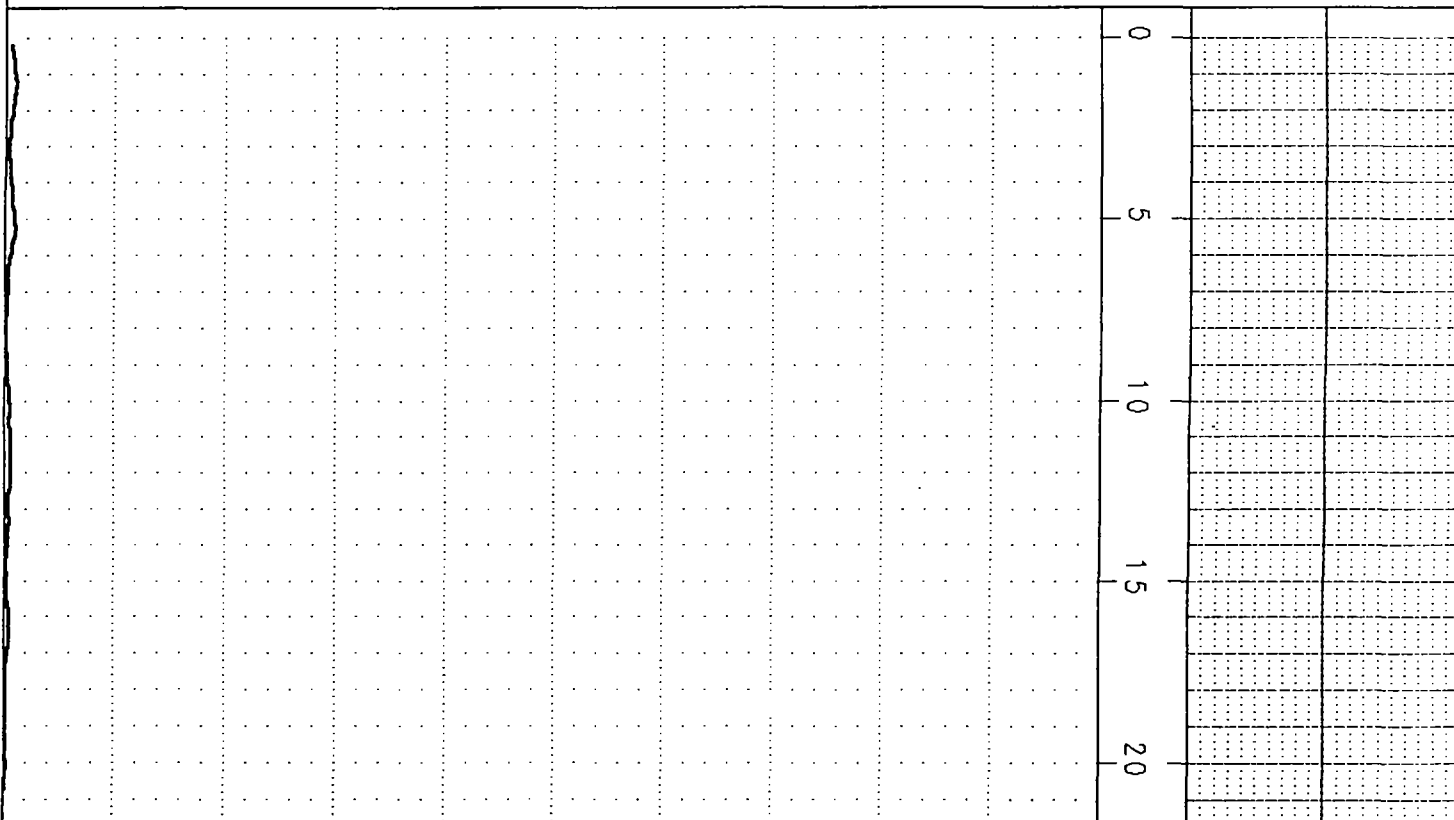
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COLOG

(C:\WESTLAKE\PVC41.GB0)

COLOG

← 0 NGamma CPM 600000 →



← 0 NGamma CPM 600000 →

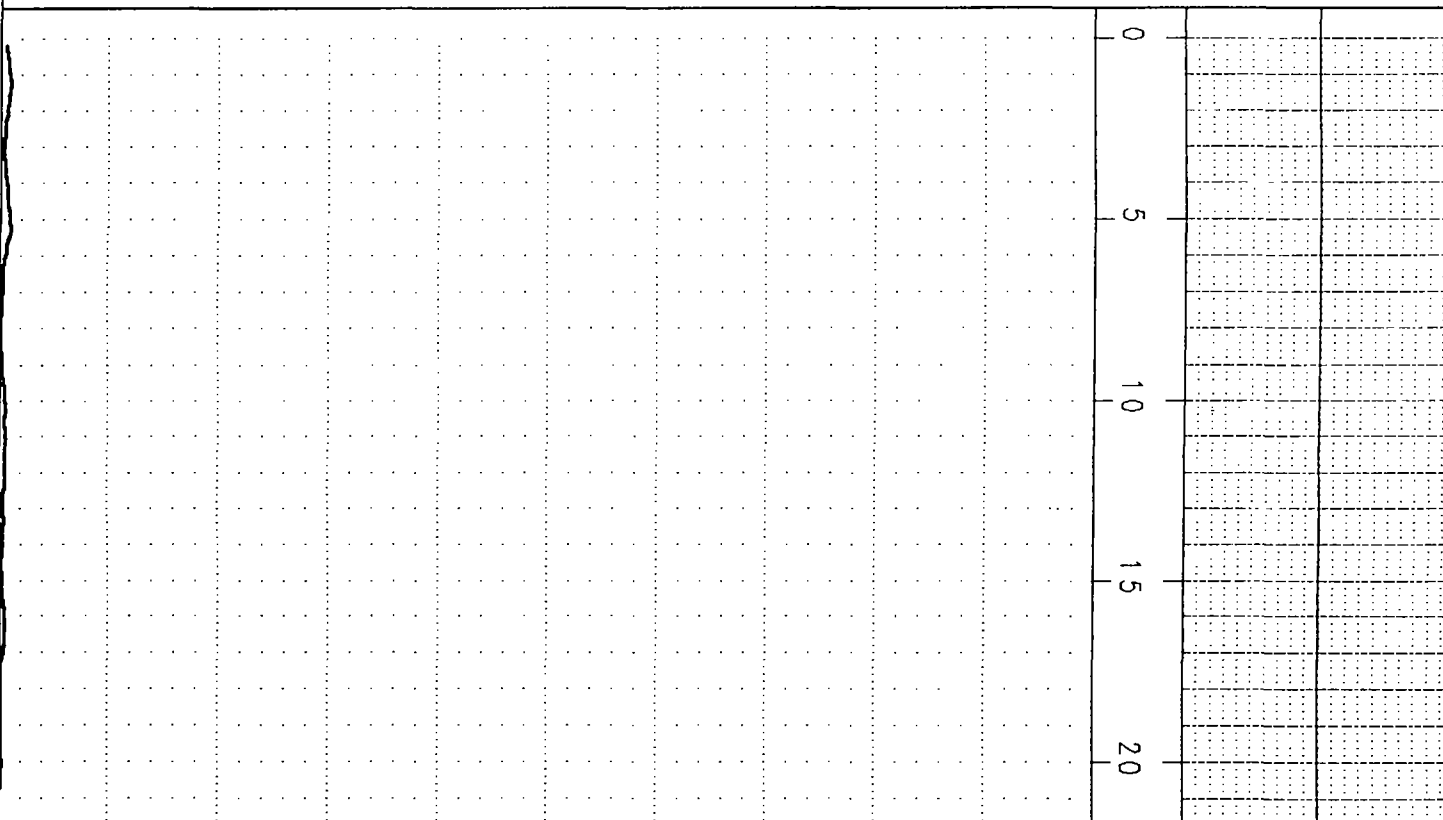
(C:\WESTLAKE\PVC41.GB0)

COLOG

(C:\WESTLAKE\PVC41.GB0)

COLOG

← 0 NGamma CPM 600000 →



← 0 NGamma CPM 600000 →

(C:\WESTLAKE\PVC41.GB0)

COLOG

**QA/QC
Background Soil
Analytical Results**

**LABORATORY PROJECT (LP) DIRECTORY FOR BACKGROUND SOIL SAMPLES
ANALYTICAL RESULTS**

Boring	Depth (feet)	Sample ID No.	PRIORITY POLLUTANT LP #	RADIONUCLIDE LP #	REANALYZED MARCH '96 RADIONUCLIDE LP #
BACKGROUND SURFACE SOIL					
Borrow Pit - loess	0	BG-BPL-0	12881	13183	--
Borrow Pit - shale	0	BG-BPS-0	12881	13183	13795
Farmer's Field	0	BG-FF-0	12881	13183	13795
McLaren/Hart Shop	0	BG-SHOP-0	12881	13183 & 13604	--

-- = Not applicable

MBT Environmental
Laboratories

3083 Gold Canal Drive
Rancho Cordova
CA 95670
Phone 916/852-6600
Fax 916/852-7292



Builders Technology

COPY

January 8, 1996

David Heinze
McLaren/Hart
502 Earth City Expressway, Suite 206
St. Louis, MO 63045

RE: LP #13183

Dear Mr. Heinze:

As was requested, the QA Department at MBT Environmental Laboratories reviewed the data received from Quanterra Environmental Services, Earth City, Missouri, for samples received from McLaren/Hart on October 26, 1995, for radioactivity analysis for the project *Westlake*.

After our careful review it was found that all QA/QC requirements were met with the following exceptions, which were covered in Quanterra's case narratives that accompany each associative report.

Isotopic Uranium

LCS 81961, A-12-0 (9659-001 and 9659-001 DUP), B-8-0 (9659-005), and B-20-0 (9659-006) had their spectral regions of interest manually expanded due to broadened peaks.

Samples B-5-0 (9659-007), B-6-0 (9659-008), B-25-0 (9659-013), B-14-0 (9659-014), BG-BPL-0 (9659-015), and BG-FF-0 (9659-017) were reanalyzed due to tracer yields below the method limit.

LCS 83844, Blank 83844, B-5-0 (9659-007dup) and B-25-0 (9659-013) had their regions of interest manually adjusted.

Blank 83844 has U-234 and U-235 activity above the MDA but below the CRDL (U-234 activity: 0.2597 pCi/gram; U-234 MDA: 0.1306 pCi/gram; U-234; U-235 activity = 0.4416 pCi/gram; U-235 MDA = - .1992 pCi/gram; CRDL: 1 pCi/gram).

The U-235 and U-238 RPDs for B-5-0 (9659-007RE) of 155% and 64% do not meet acceptance limits. The duplicate results do not fall within the three-sigma error limits of the sample activities.

Isotopic Thorium

The Th-230 and Th-232 RPDs for A-12-0 (9659-001) were both 61%, which do not meet the acceptance criteria. The duplicate results

do not fall within the three-sigma error limits of the sample activities.

LCS 81958, A-12-0 (9659-001 and 001 Dup), A-8-0 (9659-003), A-5-0 (9659-004), B-8-0 (9659-005), B-20-0 (9659-006), B-6-0 (9659-008), B-32-0 (9659-010), B-22-0 (9659-012), and B-25-0 (9659-013) had their spectral regions of interest manually expanded due to broadened peaks.

Blank 81958 has Th-230 activity above the CRDL (activity: 1.677 pCi/gram; CRDL: 1 pCi/gram). The Th-230 activities for A-8-0 (9659-003), A-5-0 (9659-004), B-32-0 (9659-010), B-22-0 (9659-012), BG-BPL-0 (9659-015), BG-BPS-0 (9659-016), BG-FF-0 (9659-017), and BG-SHOP-0 (9659-018) are less than ten times the blank activity, so they were reanalyzed (Batch 84832).

Samples B-8-0 (9659-005) and B-20-0 (9659-006) were also reanalyzed (Batch 83843) due to very high activity.

The tracer yield for LCS 83843 is above the method limit due to a short count time (yield = 114%, method limit = 110%, count time only ten minutes due to high sample activity). Although the tracer results are biased low, the recoveries are within acceptance limits.

Blank 83843 has Th-230 activity above the MDA but below the CRDL (activity = 0.8461 pCi/gram; MDA = 0.6902 pCi/gram; CRDL = 1 pCi/gram).

Samples B-8-0 (9659-005RE), B-8-0 (9659-005RE DUP), and B-20-0 (9659-006RE) had their regions of interest manually adjusted. Their Th-232 results are biased high due to tailing of the Th-230 peaks, and as a result the Th-232 RPD for B-8-0 (9659-005RE) of 116% does not meet acceptance criteria.

LCS 84832, B-32-0 (9659-010RE), and B-22-0 (9659-012RE) had their regions of interest manually adjusted.

Blank 84832 has Th-230 activity above the CRDL and Th-232 activity above the MDA due to a smeared spectra (Th-230 activity = 1.990 pCi/gram; CRDL = 1 pCi/gram; Th-232 activity = 0.3883 pCi/gram; Th-232 MDA = 0.2001 pCi/gram). The samples in Batch 84832 do not show appreciable smearing.

Although the Th-230 results exhibit some variance between the original and repeat analyses, the Th-228 and Th-232 activities are in close agreement. Therefore, the results are being reported "as is".

General Comments

At login the samples of work order 9659 were received at a temperature of 20°C.

If you have any questions concerning our review of the data, please call John Mough or myself at (916) 852-6600.

Sincerely,
MBT ENVIRONMENTAL LABORATORIES



Cheryl L. Matterson
Quality Assurance Officer

cc: John Mough, Client Services Representative
Shakoora Azimi, Laboratory Director
MBT Environmental Laboratories

MBT Environmental
Laboratories

3083 Gold Canal Drive
Rancho Cordova
CA 95670
Phone 916/852-6600
Fax 916/852-7292



for Builders, Engineers, etc.

COPY

April 11, 1996

David Heinze
McLaren/Hart
502 Earth City Expressway, Suite 206
St. Louis, MO 63045

RE: LP #13604

Dear Mr. Heinze:

As was requested, the QA Department at MBT Environmental Laboratories reviewed the data received from Quanterra Environmental Services, Earth City, Missouri, for samples received from McLaren/Hart on October 26, 1995, for radioactivity analysis for the project Westlake. Sample BG-BPS-0 (9659-016) had been requested to be reanalyzed for Isotopic Thorium.

The data was reviewed against the quality control criteria stated in the standard operating procedures provided by Quanterra. The original methods have been reviewed and no quality control criteria are listed in the methods. No more recent methods are available. Quanterra has developed in-house limits based on standard quality control protocols.

After our careful review it was found that all QA/QC requirements were met. There were no nonconformances associated with the analysis of the sample.

If you have any questions concerning our review of the data, please call John Mough or myself at (916) 852-6600.

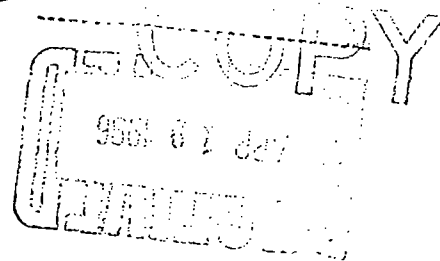
Sincerely,
MBT ENVIRONMENTAL LABORATORIES

Cheryl L. Matterson
Cheryl L. Matterson
Quality Assurance Officer

cc: John Mough, Client Services Representative
Shakoora Azimi, Laboratory Director
MBT Environmental Laboratories

MBT Environmental
Laboratories

3083 Gold Canal Drive
Rancho Cordova
CA 95670
Phone 916/852-6600
Fax 916/852-7292



Date: April 17, 1996
LP #: 13795

David Heinze
McLaren/Hart, Inc.
502 Earth City Expressway, Ste 206
St. Louis, MO 63045

Dear Mr. Heinze:

Enclosed is the copy of results from Quanterra Environmental Services for the samples for the project *West Lake*.

We have requested a revision from Quanterra Environmental Services to include the whole data sheet for Sample WL-210B-40 (10565-009). The enclosed data sheet is cut off on the left. Also, the case narrative refers to login 10418 received at 18°C, but it is login 10565. The revision will be sent subsequent to this report.

Thank you for choosing MBT Environmental Laboratories. We are looking forward to serving you in the future. Should you have any questions concerning this analytical report or the analytical methods employed, please do not hesitate to call.

Sincerely,

Edana M. Belschner
Project Coordinator

MBT Environmental
Laboratories

3083 Gold Canal Drive
Rancho Cordova
CA 95670
Phone 916/852-6600
Fax 916/852-7292



er Builders Technologies

COPY

April 17, 1996

David Heinze
McLaren/Hart
502 Earth City Expressway, Suite 206
St. Louis, MO 63045

RE: LP #13795

Dear Mr. Heinze:

As was requested, the QA Department at MBT Environmental Laboratories reviewed the data received from Quanterra Environmental Services, Earth City, Missouri, for samples received from McLaren/Hart on March 13, 1996 for radioactivity analysis for the project Westlake.

The data was reviewed against the quality control criteria stated in the standard operating procedures provided by Quanterra. The original methods have been reviewed and no quality control criteria are listed in the methods. No more recent methods are available. Quanterra has developed in-house limits based on standard quality control protocols.

After our careful review it was found that all QA/QC requirements were met, with a few exceptions, as stated in Quanterra's case narrative. These exceptions are listed below.

Analytical Notes

Isotopic Thorium

Blank94532 had Th-228 and Th-230 activity above the MDA but below the CRDL. Blank94532 and sample 10565-017 had their spectral regions of interest manually adjusted due to broadened peaks.


General

Login 10565 was received at a temperature of 18°C.

If you have any questions concerning our review of the data, please call John Mough or myself at (916) 852-6600.

Sincerely,

MBT ENVIRONMENTAL LABORATORIES



Cheryl L. Matterson

Quality Assurance Officer

cc: John Mough, Client Services Representative
Shakoora Azimi, Laboratory Director
MBT Environmental Laboratories

**QA/QC
Soil Sampling
Analytical Results**

**LABORATORY PROJECT (LP) DIRECTORY FOR SOIL BORINGS AND SURFACE SAMPLES
RADIOLOGICAL ANALYTICAL RESULTS**

Boring	Depth (feet)	Sample ID No.	RADIONUCLIDE LP #	REANALYZED MARCH '96 RADIONUCLIDE LP #	REANALYZED MAY '96 RADIONUCLIDE LP #
AREA 1					
WL-101	5	WL-101-5	12541	13795	--
	20	WL-101-20	12541	--	--
	25	WL-101-25	--	--	--
WL-102	5	WL-102-5	12541	--	--
	15	WL-102-15	12541	--	--
WL-103	5	WL-103-5	12541	--	--
	10	WL-103-10	12541	13795	--
	15	WL-103-15	--	--	--
	25	WL-103-25	--	--	--
WL-104	5	WL-104-5	12541	--	--
	20	WL-104-20	12541	--	--
	25	WL-104-25	--	--	--
	35	WL-104-35	--	--	--
WL-105	10	WL-105-10	12541	--	14465
	30	WL-105-30	12541	--	--
WL-106	0	WL-106A-0	12578	--	14465
	5	WL-106A-5	12578	--	14465
	5 DUP (L)	WL-106A-5	12578	--	--
	5 DUP (F)	WL-106B-5	12578	--	14465
	25	WL-106-25	12578	--	14465
	25 DUP (F)	WL-106B-25	12578	--	14465
	30	WL-106-30	--	--	--
	30 DUP (F)	WL-106B-30	--	--	--
WL-107	5	WL-107-5	12767	--	--
	51	WL-107-80	12767	--	--
	51 DUP (L)	WL-107-80	12767	--	--
WL-108	5	WL-108-5	12767	--	--
	22	WL-108-22	12767	--	--
	30	WL-108-30	--	--	--
WL-109	5	WL-109-5	12767	--	--
	50	WL-109-50	12767	13795	--
	50 DUP (L)	WL-109-50	12767	--	--
WL-110	5	WL-110-5	12767	--	--
	50	WL-110-50	12767	--	--
WL-111	0	A-8-0	13183	--	--
	5	WL-111-5	12676	--	--
	5 DUP (L)	WL-111-5	12676	--	--
	5 MS/MSD	WL-111-5	12676	--	--
	51	WL-111-51	12676	--	--
	51 DUP (L)	WL-111-51	12676	--	--
	51 MS/MSD	WL-111-51	12676	--	--
WL-112	0	A-14-0	13183	13795	--
	5	WL-112-5	12676	--	14465
	42	WL-112-42	12676	--	--
WL-113	5	WL-113-5	12966	--	--
	5 DUP (F)	WL-113B-5	12966	--	--
	10	WL-113-10	12966	13795	--
	45	WL-113-45	--	--	--
WL-114	0	A-12-0	13183	--	14465
	5	WL-114-5	12966	--	14465
	5 DUP (L)	WL-114-5	12966	--	--
	5 MS/MSD	WL-114-5	12966	--	--
	15	WL-115-15	12966	--	--
	15 DUP (L)	WL-115-15	12966	--	--
	15 MS/MSD	WL-115-15	12966	--	--
WL-115	5	WL-115-5	12966	--	--
	38	WL-115-38	--	--	--
	40	WL-115-40	12966	--	--
WL-116	0	A-5-0	13183	--	--
	5	WL-116-5	12966	--	--
	5 DUP (F)	WL-116B-5	12966	--	--
	10	WL-116-10	12966	--	--

**LABORATORY PROJECT (LP) DIRECTORY FOR SOIL BORINGS AND SURFACE SAMPLES
RADIOLOGICAL ANALYTICAL RESULTS**

Boring	Depth (feet)	Sample ID No.	RADIONUCLIDE LP #	REANALYZED MARCH '96 RADIONUCLIDE LP #	REANALYZED MAY '96 RADIONUCLIDE LP #
WL-117	10	WL-117-10	12966	--	14465
	25	WL-117-25	12966	--	--
WL-118	5	WL-118-5	12966	--	14465
	10	WL-118-10	12966	--	--
WL-119	5	WL-119-5	12966	--	--
	50	WL-119-50	12966	--	--
	50 DUP (L)	WL-119-50	12966	--	--
	50 DUP (F)	WL-119B-50	12966	--	--
	50 MS/MSD	WL-119-50	12966	--	--
WL-120	5	WL-120-5	12966	--	--
	50	WL-120-50	12966	--	--
	50 DUP (F)	WL-120B-50	12966	--	--
AREA 2					
WL-201	5	WL-201-5	12059	--	--
	15	WL-201-15	12059	--	--
WL-202	5	WL-202-5	12059	--	--
	5 DUP (L)	WL-202-5	12059	--	--
	15	WL-202-15	12059	--	--
WL-203	0	B-32-0	13183	13795	--
	5	WL-203-5	12059	--	--
	15	WL-203-15	12059	--	--
WL-204	5	WL-204-5	12059	--	--
	25	WL-205-25	12059	--	--
WL-205	5	WL-205-5	12541	13795	--
	15	WL-205-15	12541	--	--
WL-206	0	B-14-0	13183	--	14465
	5	WL-206-5	12578	--	--
	10	WL-206-10	12578	--	--
WL-207	5	WL-207-5	12578	--	--
	5 DUP (L)	WL-207-5	12578	--	--
	10	WL-207-10	12578	--	--
WL-208	5	WL-208-5	12871	--	14465
	5 DUP (L)	WL-208-5	12871	--	--
	9	WL-208-9	12871	--	14465
	15	WL-208-15	--	--	--
	20	WL-208-20	--	--	--
	28	WL-208-28	--	--	--
WL-209	0	B-20-0	13183	--	14465
	5	WL-209-5	12871	--	14465
	5 DUP (F)	WL-209B-5	12871	--	14465
	25	WL-209-25	12871	--	14465
	25 DUP (F)	WL-209B-25	12871	--	14465
WL-210	0	B-8-0	13183	--	14465
	5	WL-210-5	12871	--	14465
	5 DUP (F)	WL-210B-5	12871	--	14465
	15	WL-210-15	--	--	--
	40	WL-210-40	12871	13795	--
	40 DUP (F)	WL-210B-40	12871	13795	--
WL-211	5	WL-211-5	12871	--	14465
	25	WL-211-25	12871	--	--
WL-212	5	WL-212-5	12871	--	14465
	10	WL-212-10	12871	13795	--
WL-213	0	B-16-0	13183	--	14465
	5	WL-213-5	12871	--	14465
	25	WL-213-25	12871	--	14465
WL-214	5	WL-214-5	12871	--	14465
	25	WL-214-25	12871	--	--
WL-215	0	B-22-0	13183	--	14465
WL-216	5	WL-216-5	12767	--	14465
	25	WL-216-25	12767	--	--
WL-217	5	WL-217-5	12767	--	14465
	10	WL-217-10	12767	--	--

**LABORATORY PROJECT (LP) DIRECTORY FOR SOIL BORINGS AND SURFACE SAMPLES
RADIOLOGICAL ANALYTICAL RESULTS**

Boring	Depth (feet)	Sample ID No.	RADIONUCLIDE LP #	REANALYZED MARCH '96 RADIONUCLIDE LP #	REANALYZED MAY '96 RADIONUCLIDE LP #
WL-218	0	B-5-0	13183	13795	--
	5	WL-218-5	12767	--	--
	25	WL-218-25	--	--	--
	40	WL-218-40	12767	13795	--
WL-219	5	WL-219-5	12767	--	--
	10	WL-219-10	12767	--	--
WL-220	5	WL-220-5	12767	13795	--
	25	WL-220-25	12767	--	--
WL-221	5	WL-221-5	12767	--	--
	35	WL-221-35	12767	13795	--
WL-222	0	B-25-0	13183	--	14465
	5	WL-222-5	12767	--	14465
	30	WL-222-30	12767	--	--
	30 DUP (F)	WL-222B-30	--	--	--
WL-223	5	WL-223-5	12767	--	--
	22	WL-223-22	12767	--	--
WL-224	5	WL-224-5	12676	--	--
	35	WL-224-35	12676	--	--
WL-225	5	WL-225-5	12676	13795	--
	35	WL-225-35	12676	13795	--
WL-226	10	WL-226-10	12676	--	--
	20	WL-226-20	12676	--	14465
	43	WL-226-43	--	--	--
	43-MS/MSD	WL-226-43	--	--	--
WL-227	5	WL-227-5	12676	--	14465
	40	WL-227-40	12676	--	--
WL-228	5	WL-228-5	12676	--	--
	15	WL-228-15	12676	--	--
WL-229	5	WL-229-5	12676	--	--
	20	WL-229-20	12676	--	--
WL-230	5	WL-230-5	12676	--	14465
	16	WL-230-16	--	--	--
	35	WL-230-35	12676	--	--
WL-231	0	B-31-0	13183	--	14465
	5	WL-231-5	12676	--	14465
	10	WL-231-10	12676	--	--
WL-233	27	WL-233-27	12676	--	14465
	30	WL-233-30	12676	13795	--
WL-234	10	WL-234-10	12676	--	14465
	10 DUP (F)	WL-234B-10	12676	--	14465
	20	WL-234-20	12676	--	14465
	20 DUP (F)	WL-234B-20	12676	--	--
WL-235	0	B-6-0	13183	13795	--
	5	WL-235-5	12676	--	--
	30	WL-235-30	12676	--	--
WL-236	5	WL-236-5	12676	--	--
	35	WL-236-35	12676	--	--
WL-239	5	WL-239-5	12966	--	--
	25	WL-239-25	12966	--	--
WL-241	5	WL-241-5	12966	--	14465
	15	WL-241-15	12966	--	--
WL-242	0	WL-242-0.5	13402	--	14465
	2	WL-242-2	13402	--	14465
WL-243	0	WL-243	13402	--	14465
WL-244	0	WL-244	13402	--	14465
WL-245	0	WL-245	13402	--	--
WL-246	0	WL-246	13402	--	--

DUP (L) = Laboratory duplicate

DUP (F) = Field duplicate

MS/MSD = Matrix spike/matrix spike duplicate

-- = Not applicable

MBT Environmental
Laboratories

3083 Gold Canal Drive
Rancho Cordova
CA 95670
Phone 916/852-6600
Fax 916/852-7292



for Builders Technology, Inc.

COPY

September 19, 1995

David Heinze
McLaren/Hart
502 Earth City Expressway,
Suite 206
St. Louis, MO 63045

RE: LP #12059

Dear Mr. Heinze:

As was requested, the QA Department at MBT Environmental Laboratories reviewed the data received from Quanterra Environmental Services, Earth City, Missouri, for samples received from McLaren/Hart on August 3, 1995, for radioactivity analysis for the project Westlake.

After our careful review it was found that all QA/QC requirements were met with the following exceptions, which were covered in Quanterra's case narratives that accompany each associative report.

Isotopic Uranium

The blank for batch BLK74466 had U-234 activity (2.478 E-2 pCi/G) above the MDA (1.343 E-1 pCi/G) but below the CRDL of 1 pCi/G .

Isotopic Thorium

The LCS regions of interest (ROI) was manually adjusted to separate Th-229 and Th-230. The blank for the batch (BLK74466) had Th-230 activity (2.234 E-2 pCi/G) above the MDA (9.382 E-2 pCi/G) but below the CRDL of 1 pCi/G . Sample 9008-001 and the duplicate had 126% RPD for Th-230 which does not meet acceptance criteria.

General Comments

At login the samples of work order 9008 were received at a temperature of 27° C .

If you have any questions concerning our review of the data, please call John Mough or myself at (916) 852-6600.

Sincerely,
MBT ENVIRONMENTAL LABORATORIES

Cheryl L. Matterson
Cheryl L. Matterson
Quality Assurance Officer

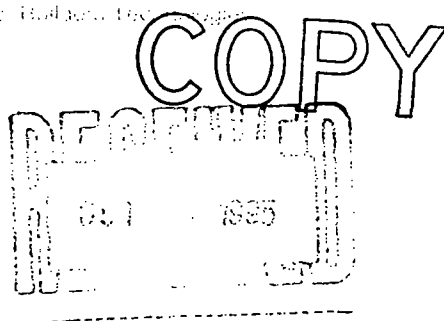
cc: John Mough, Client Services Representative
MBT Environmental Laboratories

MBT Environmental
Laboratories



MBT Environmental
Laboratories

3083 Gold Canal Drive
Rancho Cordova
CA 95670
Phone 916/852-6600
Fax 916/852-7292
October 3, 1995



David Heinze
McLaren/Hart
502 Earth City Expressway, Suite 206
St. Louis, MO 63045

RE: LP #12541

Dear Mr. Heinze:

As was requested, the QA Department at MBT Environmental Laboratories reviewed the data received from Quanterra Environmental Services, Earth City, Missouri, for samples received from McLaren/Hart on August 10, 1995, for radioactivity analysis for the project Westlake.

After our careful review it was found that all QA/QC requirements were met with the following exceptions, which were covered in Quanterra's case narratives that accompany each associative report.

Isotopic Thorium

Samples were initially analyzed, but the blank contained Th-230 at a concentration of 3.045 pCi/g. Sample WL-105-10 (9081-011) was greater than 10 times this amount and is considered acceptable. All other sample were reanalyzed. The reanalyzed batch also had Th-230 contamination at 1.45 pCi/g. Samples WL-103-10 (9081-008) and WL-104-5 (9081-009) were greater than 10 times this amount and are considered acceptable. The remaining nine samples were compared to the initial analysis and since both analyses are in agreement, and as all concentrations are close to the CRDL, the samples are being reported.

General Comments

At login the samples of work order 9081 were received at a temperature of 30°C.

If you have any questions concerning our review of the data, please call John Mough or myself at (916) 852-6600.

Sincerely,
MBT ENVIRONMENTAL LABORATORIES

Cheryl L. Matterson
Cheryl L. Matterson
Quality Assurance Officer

cc: John Mough, Client Services Representative
MBT Environmental Laboratories

MBT Environmental
Laboratories

3083 Gold Canal Drive
Rancho Cordova
CA 95670
Phone 916/852-6600
Fax 916/852-7292



COPY

September 19, 1995

David Heinze
McLaren/Hart
502 Earth City Expressway,
Suite 206
St. Louis, MO 63045

RE: LP #12541

Dear Mr. Heinze:

As was requested, the QA Department at MBT Environmental Laboratories reviewed the data received from Quanterra Environmental Services, Earth City, Missouri, for samples received from McLaren/Hart on August 10, 1995, for radioactivity analysis for the project *Westlake*.

After our careful review it was found that all QA/QC requirements were met with the following exceptions, which were covered in Quanterra's case narratives that accompany each associative report.

Isotopic Thorium

No results available at the time of review of the above tests. Samples are being re-extracted, per David Heinz, and results are to follow at a later date.

General Comments

At login the samples of work order 9081 were received at a temperature of 30° C.

If you have any questions concerning our review of the data, please call John Mough or myself at (916) 852-6600.

Sincerely,
MBT ENVIRONMENTAL LABORATORIES

Cheryl L. Matterson
Quality Assurance Officer

cc: John Mough, Client Services Representative
MBT Environmental Laboratories

MBT Environmental
Laboratories

3083 Gold Canal Drive
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CA 95670
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Fax 916/852-7292



Water Builders Technologies

COPY

October 3, 1995

David Heinze
McLaren/Hart
502 Earth City Expressway, Suite 206
St. Louis, MO 63045

RE: LP #12578

Dear Mr. Heinze:

As was requested, the QA Department at MBT Environmental Laboratories reviewed the data received from Quanterra Environmental Services, Earth City, Missouri, for samples received from McLaren/Hart on August 16 and 18, 1995, for radioactivity analysis for the project Westlake.

After our careful review it was found that all QA/QC requirements were met with the following exceptions, which were covered in Quanterra's case narratives that accompany each associative report.

Isotopic Thorium

The batch QC samples for Isotopic Thorium had an acceptable tracer yield of 79.7% for the LCS and 85.8% for the Blank. However, the batch QC had a recovery of 31.5 % and the batch QC duplicate had a recovery of 18.2%. The acceptance criteria for the yield is 20%. Although the duplicate failed to meet the criteria, it was only slightly below the limit. Sample WL-207-10 (9146-002) also had a low yield of 12%. Sample WL-207-5 (9146-001) had a Th-230 result of 1.2 pCi/g while the duplicate had a result of 1.19 pCi/g, generating an RPD of 8%, which meets QC acceptance criteria. Sample WL-207-10 (9146-002) had a Th-230 result of 1.8 pCi/g. All results were only slightly above the CRDL of 1 pCi/g. Therefore, the low yields were being attributed to matrix effect and the results were reported.

Samples were initially analyzed, but the blank contained Th-230 at a concentration of 3.045 pCi/g. The results for Sample WL-106A-5 (9125-001) through WL-106B-23 (9123-004) were greater than 10 times this amount and were considered acceptable. All other samples were reanalyzed. The reanalyzed batch also had Th-230 contamination at 1.45 pCi/g. Sample WL-106A-0 (9125-005) is greater than 10 times this amount and is considered acceptable. Sample WL-206-5 (9125-006) was compared to the initial analysis and since both analyses were in agreement, and as all concentrations were close to the CRDL, the sample was reported. Since the sample results are consistent, cross-contamination is not suspected.

General Comments

At login the samples of work order 9125 were received at a temperature of 27° C. At login the samples of work order 9146 were received at a temperature of 28° C.

If you have any questions concerning our review of the data, please call John Mough or myself at (916) 852-6600.

Sincerely,
MBT ENVIRONMENTAL LABORATORIES


Cheryl L. Matterson
Quality Assurance Officer

cc: John Mough, Client Services Representative
MBT Environmental Laboratories

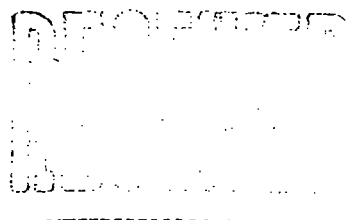
MBT Environmental
Laboratories

3083 Gold Canal Drive
Rancho Cordova
CA 95670
Phone 916/852-6600
Fax 916/852-7292

COPY



ter Builders Technologies



November 9, 1995

David Heinze
McLaren/Hart
502 Earth City Expressway, Suite 206
St. Louis, MO 63045

RE: LP #12676

Dear Mr. Heinze:

As was requested, the QA Department at MBT Environmental Laboratories reviewed the data received from Quanterra Environmental Services, Earth City, Missouri, for samples received from McLaren/Hart on September 22, 1995, for radioactivity analysis for the project *Westlake*.

After our careful review it was found that all QA/QC requirements were met with the following exceptions, which were covered in Quanterra's case narratives that accompany each associative report.

Gamma Scan

No comments.

Isotopic Uranium

Sample WL-234-10 (9407-026) contained a large amount of Th-230 which interfered with U analysis. The sample was run through two Th columns which caused low chemical yield.

Isotopic Thorium

See above.

General Comments

At login the samples of work order 9407 were received at a temperature of 20°C.

All analyses requested for the water samples were cancelled. Later sample WL-231-031 was requested to be analyzed and the findings of such analysis will follow at a later date.

If you have any questions concerning our review of the data, please call John Mough or myself at (916) 852-6600.

Sincerely,
MBT ENVIRONMENTAL LABORATORIES


Cheryl L. Matterson
Quality Assurance Officer

cc: John Mough, Client Services Representative
Shakoora Azimi, Laboratory Director
MBT Environmental Laboratories

MBT Environmental
Laboratories

3083 Gold Canal Drive
Rancho Cordova
CA 95670
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NOV 10 1995
LABORATORY

November 9, 1995

David Heinze
McLaren/Hart
502 Earth City Expressway, Suite 206
St. Louis, MO 63045

RE: LP #12767

Dear Mr. Heinze:

As was requested, the QA Department at MBT Environmental Laboratories reviewed the data received from Quanterra Environmental Services, Earth City, Missouri, for samples received from McLaren/Hart on September 8, 1995, for radioactivity analysis for the project Westlake.

After our careful review it was found that all QA/QC requirements were met with the following exceptions, which were covered in Quanterra's case narratives that accompany each associative report.

Gross Alpha

Due to the high amounts of solids in the samples for Gross Alpha analysis, the sample volume was reduced to prevent exceeding the residue weight limitation for Gross Alpha analysis. The samples were counted for 1000 minutes, but the CRDL was not achieved. The samples were less than the MDA.

Gamma Scan

No comments.

Isotopic Uranium

No comments.

Isotopic Thorium

Sample WL-108-22 (9290-024DUP) had a low chemical yield of 0.62%. This sample appeared to contain a high amount of salts prior to performing the electrodeposition, which contributed to the low recovery. No sample remains for reanalysis. The associated blank and Laboratory Control Spike (LCS) had reasonable recoveries (102% and 82% respectively). Sample WL-108-22 (9290-024) had a chemical yield of 52% which is above the acceptable criteria.

Samples WL-107-80 (9290-001) through WL-219A-10 (9290-020) were analyzed for Isotopic Thorium in batch 77626. However, the blank for this batch had Th-230 contamination of 4.358 pCi/g which is believed to have been from the glassware used during the analysis. Therefore, all samples which were either below the CRDL or greater than 10 times the blank contamination were considered acceptable. All other samples were reanalyzed. The reanalysis of these samples had no contamination in the associated batch specific blank.

General Comments

At login the samples of work order 9290 were received at a temperature of 20°C.

If you have any questions concerning our review of the data, please call John Mough or myself at (916) 852-6600.

Sincerely,

MBT ENVIRONMENTAL LABORATORIES



Cheryl L. Matterson

Quality Assurance Officer

cc: John Mough, Client Services Representative
Shakoora Azimi, Laboratory Director
MBT Environmental Laboratories

MBT Environmental
Laboratories

3083 Gold Canal Drive
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Fax 916/852-7292



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COPY

November 7, 1995

David Heinze
McLaren/Hart
502 Earth City Expressway, Suite 206
St. Louis, MO 63045

RE: LP #12871

Dear Mr. Heinze:

As was requested, the QA Department at MBT Environmental Laboratories reviewed the data received from Quanterra Environmental Services, Earth City, Missouri, for samples received from McLaren/Hart on September 1, 1995, for radioactivity analysis for the project *Westlake*.

After our careful review it was found that all QA/QC requirements were met with the following exceptions, which were covered in Quanterra's case narratives that accompany each associative report.

Gamma Scan

No comments.

Gross Alpha

Samples WL-219-25 (9244-001) and WL-220-30 (9244-002) had high amounts of solids which required reducing the sample volume.

Isotopic Uranium

Due to suspected tailing of U^{234} into the U^{235} region of interest for alpha spectroscopy, a review of the gamma and alpha spectroscopy data was conducted for samples WL-209-5 (9244-005), WL-290B-5 (9244-006), WL-210-5 (9244-009), and WL-210B-5 (9244).

The laboratory reports upon contact with the client, the site contains processing waste from an enrichment process. The normal equilibrium relationships are not considered valid for samples of this project.

The review of gamma data for U^{235} for WL-209-5 (9244-005) does not agree with the alpha spectroscopy. The gamma report originally reported an activity of 224.5 pCi/g for U^{235} was based on the 185.71 keV energy line. The interference report does not show a correction for Ra^{226} on the 186 keV energy line although U^{235} - Ra^{236}

interference is in the interference library. Therefore, the best result for U^{235} is based on the 205.31 keV energy line which reported 74.83 ± 22.9 pCi/g. This agrees with the alpha spectroscopy report for U^{235} of 72.44 ± 12.68 pCi/g. Therefore, this sample was not reanalyzed for alpha spectroscopy and the gamma spectroscopy report was corrected.

The gamma data for U^{235} for WL-290b_5 (9244-006) overlaps the result for alpha spectroscopy. The gamma report for U^{235} shows the reported peak was based on 205.31 keV and reported as 62.58 ± 25.36 pCi/g. The alpha spectroscopy result for U^{235} is reported as 114.7 ± 19.09 pCi/g. Since the error for these analyses overlap, the result is considered acceptable although the alpha spectroscopy result may be slightly biased high due to the tailing of the U^{234} peak into the U^{235} region of interest.

For sample WL-210-5 (9244-009) the gamma data for U^{235} is reported as 45.56 pCi/g based on the 185.71 keV energy line. The interference report does not show a correction for Ra^{226} on the 186 keV energy line although the U^{235} - Ra^{226} interference is in the interference library. The 205.31 keV energy was not identified. Therefore, the result for U^{235} should be <10.12 pCi/g (with an error of ± 1.82 pCi/g). The alpha spectroscopy reports U^{235} with a concentration of 15.49 ± 2.876 pCi/g, which agrees with the revised gamma report.

The gamma data for U^{235} for WL-210B-5 (9244-010) overlaps the result for alpha spectroscopy. The gamma report for U^{235} shows the reported peak was based on 205.31 and 185.71 keV energy lines. The interference report does not show a correction for Ra^{226} on the 186 keV energy line although the U^{235} - Ra^{226} interference is in the interference library. The gamma data has been corrected to use only the 205.31 keV energy line which changes the reported value to 27.19 ± 11.93 pCi/g. The alpha spectroscopy result for U^{235} is reported as 43.76 ± 7.896 pCi/g. Since the error for these analyses overlap, the result is considered acceptable although the alpha result may be slightly biased high due to the tailing of the U^{234} peak into the U^{235} region of interest.

A review of other gamma spectroscopy results for U^{235} was conducted. All samples had no detectable U^{235} except for WL-211-5 (9244-013). Sample WL-211-5 (9244-013) had U^{235} originally reported based on the 185.71 keV energy line. The interference report does not show a correction for Ra^{226} on the 186 keV energy line although the U^{235} - Ra^{226} interference is in the interference library. The gamma data has been corrected to use only the 205.31 keV energy line which changes the reported value to <0.75 pCi/g.

Isotopic Thorium

Sample WL-220-30 (9244-002) had a low chemical yield of 19%. The

associated blank and Laboratory Control Sample (LCS) had recoveries of 102% and 82% respectively. Sample WL-219-25 (9244-001) had an acceptable chemical yield of 57%. No sample remained for reanalysis.

Sample WL-209-5 (9244-005) was reanalyzed due to high Th^{230} activity. One gram of the sample was redigested and diluted to 50ml. A 0.250 ml aliquot was removed in duplicate for analysis which corresponds to 0.005g of sample. The Th^{230} activity was still extremely high (167000 pCi/g). A review of the spectrum indicated a possible tailing of the Th^{230} into the Th^{232} region of interest due to high Th^{230} activity. The Th^{228} and Th^{232} equilibrium ratio does not agree. Since the history of these samples is unknown to the reviewer at this time, the data is being reported "as is" by the laboratory. However, the client may want to discard the Th^{232} results if the sample was composed of thorium decay in equilibrium.

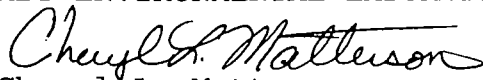
The blank contained Th-230 at a concentration which was above the MDA but below the CRDL.

General Comments

At login the samples of work order 9244 were received at a temperature of 28°C.

If you have any questions concerning our review of the data, please call John Mough or myself at (916) 852-6600.

Sincerely,
MBT ENVIRONMENTAL LABORATORIES


Cheryl L. Matterson
Quality Assurance Officer

cc: John Mough, Client Services Representative
Shakoora Azimi, Laboratory Director
MBT Environmental Laboratories

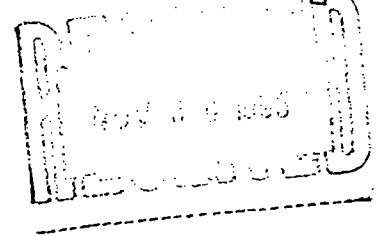
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Water Builders Technologies

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November 28, 1995

David Heinze
McLaren/Hart
502 Earth City Expressway, Suite 206
St. Louis, MO 63045

RE: LP #12966

Dear Mr. Heinze:

As was requested, the QA Department at MBT Environmental Laboratories reviewed the data received from Quanterra Environmental Services, Earth City, Missouri, for samples received from McLaren/Hart on October 9, 1995, for radioactivity analysis for the project Westlake.

After our careful review it was found that all QA/QC requirements were met with the following exceptions, which were covered in Quanterra's case narratives that accompany each associative report.

Gamma Scan

No comments.

Isotopic Uranium

Sample WL-117-10 (9506-019) originally had a chemical yield of 12.2% which was below the lower acceptance limit of 20%. This sample was reanalyzed. The LCS for batch 81905 had an acceptable chemical yield but had a recovery of 190% for U-238 which is outside the acceptance criteria and 155% for U-234. The LCS Duplicate for this batch had a recovery of 137% for U-238 and 145% for U-234, both of which are acceptable. The entire batch was reanalyzed. The LCS for the reanalyzed batch had a chemical yield of 18.78% which is slightly below the acceptance criteria of 20%. The U-238 recovery was 134% and 158% for U-234, both of which were acceptable. The sample data from the reanalysis was compared to the initial analysis and the data are in agreement. Therefore, the data from both the initial and reanalysis are being reported.

Isotopic Thorium

The blank (81092) has Th-230 activity (0.1161 pCi/g) above the MDA of 0.007082 pCi/g but below the CRDL of 1 pCi/g.

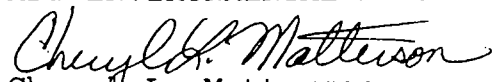
General Comments

At login the samples of work order 9506 were received at a temperature of 20°C.

If you have any questions concerning our review of the data, please call John Mough or myself at (916) 852-6600.

Sincerely,

MBT ENVIRONMENTAL LABORATORIES



Cheryl L. Matterson

Quality Assurance Officer

cc: John Mough, Client Services Representative
Shakoora Azimi, Laboratory Director
MBT Environmental Laboratories

MBT Environmental
Laboratories

3083 Gold Canal Drive
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Builders Technology

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January 8, 1996

David Heinze
McLaren/Hart
502 Earth City Expressway, Suite 206
St. Louis, MO 63045

RE: LP #13183

Dear Mr. Heinze:

As was requested, the QA Department at MBT Environmental Laboratories reviewed the data received from Quanterra Environmental Services, Earth City, Missouri, for samples received from McLaren/Hart on October 26, 1995, for radioactivity analysis for the project Westlake.

After our careful review it was found that all QA/QC requirements were met with the following exceptions, which were covered in Quanterra's case narratives that accompany each associative report.

Isotopic Uranium

LCS 81961, A-12-0 (9659-001 and 9659-001 DUP), B-8-0 (9659-005), and B-20-0 (9659-006) had their spectral regions of interest manually expanded due to broadened peaks.

Samples B-5-0 (9659-007), B-6-0 (9659-008), B-25-0 (9659-013), B-14-0 (9659-014), BG-BPL-0 (9659-015), and BG-FF-0 (9659-017) were reanalyzed due to tracer yields below the method limit.

LCS 83844, Blank 83844, B-5-0 (9659-007dup) and B-25-0 (9659-013) had their regions of interest manually adjusted.

Blank 83844 has U-234 and U-235 activity above the MDA but below the CRDL (U-234 activity: 0.2597 pCi/gram; U-234 MDA: 0.1306 pCi/gram; U-234; U-235 activity = 0.4416 pCi/gram; U-235 MDA = - .1992 pCi/gram; CRDL: 1 pCi/gram).

The U-235 and U-238 RPDs for B-5-0 (9659-007RE) of 155% and 64% do not meet acceptance limits. The duplicate results do not fall within the three-sigma error limits of the sample activities.

Isotopic Thorium

The Th-230 and Th-232 RPDs for A-12-0 (9659-001) were both 61%, which do not meet the acceptance criteria. The duplicate results

do not fall within the three-sigma error limits of the sample activities.

LCS 81958, A-12-0 (9659-001 and 001 Dup), A-8-0 (9659-003), A-5-0 (9659-004), B-8-0 (9659-005), B-20-0 (9659-006), B-6-0 (9659-008), B-32-0 (9659-010), B-22-0 (9659-012), and B-25-0 (9659-013) had their spectral regions of interest manually expanded due to broadened peaks.

Blank 81958 has Th-230 activity above the CRDL (activity: 1.677 pCi/gram; CRDL: 1 pCi/gram). The Th-230 activities for A-8-0 (9659-003), A-5-0 (9659-004), B-32-0 (9659-010), B-22-0 (9659-012), BG-BPL-0 (9659-015), BG-BPS-0 (9659-016), BG-FF-0 (9659-017), and BG-SHOP-0 (9659-018) are less than ten times the blank activity, so they were reanalyzed (Batch 84832).

Samples B-8-0 (9659-005) and B-20-0 (9659-006) were also reanalyzed (Batch 83843) due to very high activity.

The tracer yield for LCS 83843 is above the method limit due to a short count time (yield = 114%, method limit = 110%, count time only ten minutes due to high sample activity). Although the tracer results are biased low, the recoveries are within acceptance limits.

Blank 83843 has Th-230 activity above the MDA but below the CRDL (activity = 0.8461 pCi/gram; MDA = 0.6902 pCi/gram; CRDL = 1 pCi/gram).

Samples B-8-0 (9659-005RE), B-8-0 (9659-005RE DUP), and B-20-0 (9659-006RE) had their regions of interest manually adjusted. Their Th-232 results are biased high due to tailing of the Th-230 peaks, and as a result the Th-232 RPD for B-8-0 (9659-005RE) of 116% does not meet acceptance criteria.

LCS 84832, B-32-0 (9659-010RE), and B-22-0 (9659-012RE) had their regions of interest manually adjusted.

Blank 84832 has Th-230 activity above the CRDL and Th-232 activity above the MDA due to a smeared spectra (Th-230 activity = 1.990 pCi/gram; CRDL = 1 pCi/gram; Th-232 activity = 0.3883 pCi/gram; Th-232 MDA = 0.2001 pCi/gram). The samples in Batch 84832 do not show appreciable smearing.

Although the Th-230 results exhibit some variance between the original and repeat analyses, the Th-228 and Th-232 activities are in close agreement. Therefore, the results are being reported "as is".

General Comments

At login the samples of work order 9659 were received at a temperature of 20°C.

If you have any questions concerning our review of the data, please call John Mough or myself at (916) 852-6600.

Sincerely,
MBT ENVIRONMENTAL LABORATORIES



Cheryl L. Matterson
Quality Assurance Officer

cc: John Mough, Client Services Representative
Shakoora Azimi, Laboratory Director
MBT Environmental Laboratories

MBT Environmental
Laboratories

3083 Gold Canal Drive
Rancho Cordova
CA 95670
Phone 916/852-6600
Fax 916/852-7292



Environmental Technologies

COPY

February 19, 1996

David Heinze
McLaren/Hart
502 Earth City Expressway, Suite 206
St. Louis, MO 63045

RE: LP #13402

Dear Mr. Heinze:

As was requested, the QA Department at MBT Environmental Laboratories reviewed the data received from Quanterra Environmental Services, Earth City, Missouri, for samples received from McLaren/Hart on January 3, 1996, for radioactivity analysis for the project Westlake. The data was reviewed against the quality control criteria stated in the standard operating procedures provided by Quanterra.

After our careful review it was found that all QA/QC requirements were met with the following exceptions, which were covered in Quanterra's case narratives that accompany each associative report.

Thorium

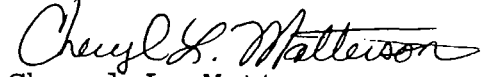
Blank88056 and Blank88580 had Th-230 activity above the MDA but below the CRDL (Blank88056 activity: $9.245\text{E}-1$ pCi/gram; Blank88056 error: $3.277\text{E}-1$ pCi/gram; Blank88056 MDA: $1.830\text{E}-2$ pCi/gram; Blank88580 activity: $3.095\text{E}-2$ pCi/gram; Blank88580 error: $2.296\text{E}-2$ pCi/gram; Blank88580 MDA: $2.32\text{E}-2$ pCi/gram; CRDL: $1\text{E}+0$ pCi/gram). Quanterra's SOP requires that the activity in the blank be below the MDA. The following samples were associated with Blank88056: WL-242-0.5, WL-243, WL-244, WL-245, and WL-246. The following samples were associated with Blank88580: WL-242-2.

The Th-230 and Th-232 RPDs for WL-244 (10064-004 (95% and 114%)) did not meet acceptance criteria. The duplicate results did not fall within three-sigma error limits of the sample activities.

If you have any questions concerning our review of the data, please call John Mough or myself at (916) 852-6600.

Sincerely,

MBT ENVIRONMENTAL LABORATORIES



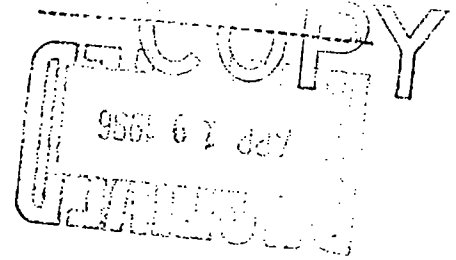
Cheryl L. Matterson

Quality Assurance Officer

cc: John Mough, Client Services Representative
Shakoora Azimi, Laboratory Director
MBT Environmental Laboratories

MBT Environmental
Laboratories

3083 Gold Canal Drive
Rancho Cordova
CA 95670
Phone 916/852-6600
Fax 916/852-7292



Date: April 17, 1996
LP #: 13795

David Heinze
McLaren/Hart, Inc.
502 Earth City Expressway, Ste 206
St. Louis, MO 63045

Dear Mr. Heinze:

Enclosed is the copy of results from Quanterra Environmental Services for the samples for the project *West Lake*.

We have requested a revision from Quanterra Environmental Services to include the whole data sheet for Sample WL-210B-40 (10565-009). The enclosed data sheet is cut off on the left. Also, the case narrative refers to login 10418 received at 18°C, but it is login 10565. The revision will be sent subsequent to this report.

Thank you for choosing MBT Environmental Laboratories. We are looking forward to serving you in the future. Should you have any questions concerning this analytical report or the analytical methods employed, please do not hesitate to call.

Sincerely,

Edana M. Belschner
Project Coordinator

MBT Environmental
Laboratories

3083 Gold Canal Drive
Rancho Cordova
CA 95670
Phone 916/852-6600
Fax 916/852-7292



er Builders Technologies

COPY

April 17, 1996

David Heinze
McLaren/Hart
502 Earth City Expressway, Suite 206
St. Louis, MO 63045

RE: LP #13795

Dear Mr. Heinze:

As was requested, the QA Department at MBT Environmental Laboratories reviewed the data received from Quanterra Environmental Services, Earth City, Missouri, for samples received from McLaren/Hart on March 13, 1996 for radioactivity analysis for the project Westlake.

The data was reviewed against the quality control criteria stated in the standard operating procedures provided by Quanterra. The original methods have been reviewed and no quality control criteria are listed in the methods. No more recent methods are available. Quanterra has developed in-house limits based on standard quality control protocols.

After our careful review it was found that all QA/QC requirements were met, with a few exceptions, as stated in Quanterra's case narrative. These exceptions are listed below.

Analytical Notes

Isotopic Thorium

Blank94532 had Th-228 and Th-230 activity above the MDA but below the CRDL. Blank94532 and sample 10565-017 had their spectral regions of interest manually adjusted due to broadened peaks.

General

Login 10565 was received at a temperature of 18°C.

If you have any questions concerning our review of the data, please call John Mough or myself at (916) 852-6600.

Sincerely,

MBT ENVIRONMENTAL LABORATORIES




Cheryl L. Matterson

Quality Assurance Officer

cc: John Mough, Client Services Representative
Shakoora Azimi, Laboratory Director
MBT Environmental Laboratories

COPY

MBT MEMO

To: David Heinze, McLaren-Hart, St. Louis
From: John Mough 
Subject: Westlake 14465
Date: July 29, 1996

After our careful review, all QA/QC requirements were met with the following exceptions, which were not covered in Quanterra's case narratives that accompany each associative report.

Isotopic Thorium

QC BLK 100705-1 had TH-230 activity at 0.54 pCi/g. This blank goes with samples 1-20. Only two samples had activity MDA < sample < 10 times BLK; WL-231-0 (11086-007) and WL-217-5 (11086-11); results for these two samples should be considered suspect.

QC BLK 100706-1 had TH-230 activity at 0.26 pCi/g. This blank goes with samples 21-40. Of the associated samples, only one had TH-230 activity MDA < sample < 10 times BLK activity; this is WL-106-25 (11086-028); results for this sample should be considered suspect.

QC BLK 100707-1 had TH-230 activity at 0.75 pCi/g. This blank goes with samples 41-47. Of the associated samples, they all had TH-230 activity greater than 10 times BLK.

Duplicate results for batch 100706 had a relative percent difference for TH-230 of 102%, indicating possible sample inhomogeneity.

The yield for sample WL-234-10 (11086-013) was 112%, above the acceptance limits of 110%. The sample was extracted/analyzed twice and exhibited similar results, indicative of matrix interferences.

If you have any questions concerning our review of the data, please call me at (916) 852-6600.

QA/QC
Perched Water Sampling
Analytical Results

**LABORATORY PROJECT (LP) DIRECTORY FOR CONTINGENCY GRAB
PERCHED WATER RADIOLOGICAL ANALYTICAL RESULTS**

Boring	Depth (feet)	Sample ID No.	RADIONUCLIDE LP #
CONTINGENCY GRAB PERCHED WATER			
WL-108	22	WL-108-22	12767
WL-219	25	WL-219-25	12871
WL-220	20	WL-220-20	12871
WL-231	31	WL-231-31	13122

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3083 Gold Canal Drive
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COPY

November 9, 1995

David Heinze
McLaren/Hart
502 Earth City Expressway, Suite 206
St. Louis, MO 63045

RE: LP #12767

Dear Mr. Heinze:

As was requested, the QA Department at MBT Environmental Laboratories reviewed the data received from Quanterra Environmental Services, Earth City, Missouri, for samples received from McLaren/Hart on September 8, 1995, for radioactivity analysis for the project *Westlake*.

After our careful review it was found that all QA/QC requirements were met with the following exceptions, which were covered in Quanterra's case narratives that accompany each associative report.

Gross Alpha

Due to the high amounts of solids in the samples for Gross Alpha analysis, the sample volume was reduced to prevent exceeding the residue weight limitation for Gross Alpha analysis. The samples were counted for 1000 minutes, but the CRDL was not achieved. The samples were less than the MDA.

Gamma Scan

No comments.

Isotopic Uranium

No comments.

Isotopic Thorium

Sample WL-108-22 (9290-024DUP) had a low chemical yield of 0.62%. This sample appeared to contain a high amount of salts prior to performing the electrodeposition, which contributed to the low recovery. No sample remains for reanalysis. The associated blank and Laboratory Control Spike (LCS) had reasonable recoveries (102% and 82% respectively). Sample WL-108-22 (9290-024) had a chemical yield of 52% which is above the acceptable criteria.

Samples WL-107-80 (9290-001) through WL-219A-10 (9290-020) were analyzed for Isotopic Thorium in batch 77626. However, the blank for this batch had Th-230 contamination of 4.358 pCi/g which is believed to have been from the glassware used during the analysis. Therefore, all samples which were either below the CRDL or greater than 10 times the blank contamination were considered acceptable. All other samples were reanalyzed. The reanalysis of these samples had no contamination in the associated batch specific blank.

General Comments

At login the samples of work order 9290 were received at a temperature of 20°C.

If you have any questions concerning our review of the data, please call John Mough or myself at (916) 852-6600.

Sincerely,

MBT ENVIRONMENTAL LABORATORIES



Cheryl L. Matterson

Quality Assurance Officer

cc: John Mough, Client Services Representative
Shakoora Azimi, Laboratory Director
MBT Environmental Laboratories

MBT Environmental
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3083 Gold Canal Drive
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Fax 916/852-7292



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November 7, 1995

David Heinze
McLaren/Hart
502 Earth City Expressway, Suite 206
St. Louis, MO 63045

RE: LP #12871

Dear Mr. Heinze:

As was requested, the QA Department at MBT Environmental Laboratories reviewed the data received from Quanterra Environmental Services, Earth City, Missouri, for samples received from McLaren/Hart on September 1, 1995, for radioactivity analysis for the project Westlake.

After our careful review it was found that all QA/QC requirements were met with the following exceptions, which were covered in Quanterra's case narratives that accompany each associative report.

Gamma Scan

No comments.

Gross Alpha

Samples WL-219-25 (9244-001) and WL-220-30 (9244-002) had high amounts of solids which required reducing the sample volume.

Isotopic Uranium

Due to suspected tailing of U^{234} into the U^{235} region of interest for alpha spectroscopy, a review of the gamma and alpha spectroscopy data was conducted for samples WL-209-5 (9244-005), WL-290B-5 (9244-006), WL-210-5 (9244-009), and WL-210B-5 (9244).

The laboratory reports upon contact with the client, the site contains processing waste from an enrichment process. The normal equilibrium relationships are not considered valid for samples of this project.

The review of gamma data for U^{235} for WL-209-5 (9244-005) does not agree with the alpha spectroscopy. The gamma report originally reported an activity of 224.5 pCi/g for U^{235} was based on the 185.71 keV energy line. The interference report does not show a correction for Ra^{226} on the 186 keV energy line although U^{235} - Ra^{236}

interference is in the interference library. Therefore, the best result for U^{235} is based on the 205.31 keV energy line which reported 74.83 ± 22.9 pCi/g. This agrees with the alpha spectroscopy report for U^{235} of 72.44 ± 12.68 pCi/g. Therefore, this sample was not reanalyzed for alpha spectroscopy and the gamma spectroscopy report was corrected.

The gamma data for U^{235} for WL-290b_5 (9244-006) overlaps the result for alpha spectroscopy. The gamma report for U^{235} shows the reported peak was based on 205.31 keV and reported as 62.58 ± 25.36 pCi/g. The alpha spectroscopy result for U^{235} is reported as 114.7 ± 19.09 pCi/g. Since the error for these analyses overlap, the result is considered acceptable although the alpha spectroscopy result may be slightly biased high due to the tailing of the U^{234} peak into the U^{235} region of interest.

For sample WL-210-5 (9244-009) the gamma data for U^{235} is reported as 45.56 pCi/g based on the 185.71 keV energy line. The interference report does not show a correction for Ra^{226} on the 186 keV energy line although the U^{235} - Ra^{226} interference is in the interference library. The 205.31 keV energy was not identified. Therefore, the result for U^{235} should be <10.12 pCi/g (with an error of ± 1.82 pCi/g). The alpha spectroscopy reports U^{235} with a concentration of 15.49 ± 2.876 pCi/g, which agrees with the revised gamma report.

The gamma data for U^{235} for WL-210B-5 (9244-010) overlaps the result for alpha spectroscopy. The gamma report for U^{235} shows the reported peak was based on 205.31 and 185.71 keV energy lines. The interference report does not show a correction for Ra^{226} on the 186 keV energy line although the U^{235} - Ra^{226} interference is in the interference library. The gamma data has been corrected to use only the 205.31 keV energy line which changes the reported value to 27.19 ± 11.93 pCi/g. The alpha spectroscopy result for U^{235} is reported as 43.76 ± 7.896 pCi/g. Since the error for these analyses overlap, the result is considered acceptable although the alpha result may be slightly biased high due to the tailing of the U^{234} peak into the U^{235} region of interest.

A review of other gamma spectroscopy results for U^{235} was conducted. All samples had no detectable U^{235} except for WL-211-5 (9244-013). Sample WL-211-5 (9244-013) had U^{235} originally reported based on the 185.71 keV energy line. The interference report does not show a correction for Ra^{226} on the 186 keV energy line although the U^{235} - Ra^{226} interference is in the interference library. The gamma data has been corrected to use only the 205.31 keV energy line which changes the reported value to <0.75 pCi/g.

Isotopic Thorium

Sample WL-220-30 (9244-002) had a low chemical yield of 19%. The

associated blank and Laboratory Control Sample (LCS) had recoveries of 102% and 82% respectively. Sample WL-219-25 (9244-001) had an acceptable chemical yield of 57%. No sample remained for reanalysis.

Sample WL-209-5 (9244-005) was reanalyzed due to high Th^{230} activity. One gram of the sample was redigested and diluted to 50ml. A 0.250 ml aliquot was removed in duplicate for analysis which corresponds to 0.005g of sample. The Th^{230} activity was still extremely high (167000 pCi/g). A review of the spectrum indicated a possible tailing of the Th^{230} into the Th^{232} region of interest due to high Th^{230} activity. The Th^{228} and Th^{232} equilibrium ratio does not agree. Since the history of these samples is unknown to the reviewer at this time, the data is being reported "as is" by the laboratory. However, the client may want to discard the Th^{232} results if the sample was composed of thorium decay in equilibrium.


The blank contained Th^{230} at a concentration which was above the MDA but below the CRDL.

General Comments

At login the samples of work order 9244 were received at a temperature of 28°C.

If you have any questions concerning our review of the data, please call John Mough or myself at (916) 852-6600.

Sincerely,
MBT ENVIRONMENTAL LABORATORIES


Cheryl L. Matterson
Quality Assurance Officer

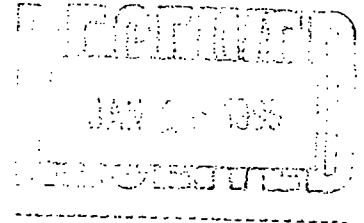
cc: John Mough, Client Services Representative
Shakoora Azimi, Laboratory Director
MBT Environmental Laboratories

MBT Environmental
Laboratories

3083 Gold Canal Drive
Rancho Cordova
CA 95670
Phone 916/852-6600
Fax 916/852-7292



Water Builders Technologies



MEMORANDUM

TO: David Heinze, McLaren/Hart

FROM: Cheryl Matterson, Quality Assurance Officer *CM*
MBT Environmental Laboratories

DATE: January 9, 1996

SUBJECT: Revision of Validation Letter Dated January 4, 1995

cc: John Mough, Client Services Representative
Shakoora Azimi, Laboratory Director
MBT Environmental Laboratories

Due to a clerical error, the letter dated January 4, 1995, regarding the validation of LP #13122, radioactivity analysis for the project *Westlake*, has been revised. The revision is enclosed. Please disregard the previous letter.

MBT Environmental
Laboratories

3083 Gold Canal Drive
Rancho Cordova
CA 95670
Phone 916/852-6600
Fax 916/852-7292



Water Builders Technologies

COPY

January 9, 1996

David Heinze
McLaren/Hart
502 Earth City Expressway, Suite 206
St. Louis, MO 63045

RE: LP #13122

Dear Mr. Heinze:

As was requested, the QA Department at MBT Environmental Laboratories reviewed the data received from Quanterra Environmental Services, Earth City, Missouri, for samples received from McLaren/Hart on September 22, 1995, for radioactivity analysis for the project Westlake.

After our careful review it was found that all QA/QC requirements were met with the following exceptions, which were covered in Quanterra's case narratives that accompany each associative report.

General Comments

Sample WL-231-31 (9407-035) contains high solids which required the aliquot size to be reduced to prevent exceeding residue weight limitations. Due to the decreased amount of sample taken for analysis, the alpha CRDL was not met.

At login the samples of work order 9407 were received at a temperature of 20°C.

If you have any questions concerning our review of the data, please call John Mough or myself at (916) 852-6600.

Sincerely,
MBT ENVIRONMENTAL LABORATORIES

Cheryl L. Matterson
Cheryl L. Matterson
Quality Assurance Officer

cc: John Mough, Client Services Representative
Shakoora Azimi, Laboratory Director
MBT Environmental Laboratories

MBT Environmental
Laboratories

3083 Gold Canal Drive
Rancho Cordova
CA 95670
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Water Builders Technology

COPY

January 4, 1996

David Heinze
McLaren/Hart
502 Earth City Expressway, Suite 206
St. Louis, MO 63045

RE: LP #13122.

Dear Mr. Heinze:

As was requested, the QA Department at MBT Environmental Laboratories reviewed the data received from Quanterra Environmental Services, Earth City, Missouri, for samples received from McLaren/Hart on September 22, 1995, for radioactivity analysis for the project Westlake.

After our careful review it was found that all QA/QC requirements were met with the following exceptions, which were covered in Quanterra's case narratives that accompany each associative report.

Isotopic Uranium

Blank 83186 has U-238 activity above the MDA but below the CRDL.

Isotopic Thorium

The Blank Th-229 tracer peak was smeared, causing Th-230 activity above the CRDL and Th-232 activity above the MDA.

Sample WL-231-31 (9407-035) has a tracer yield for Thorium below the method limit. Insufficient sample remains for reanalysis.

The LCS and LCS duplicate regions of interest were manually adjusted due to peak broadening.


General Comments

Sample SW-N-UNFILTERED (9724-004) has tracer yields below the method detection limit. The Laboratory Control Spike (LCS) and Method Blank have acceptable yields, so the poor sample yields appear to be due to matrix effects.

At login the samples of work order 9407 were received at a temperature of 20°C.

If you have any questions concerning our review of the data, please call John Mough or myself at (916) 852-6600.

Sincerely,
MBT ENVIRONMENTAL LABORATORIES


Cheryl L. Matterson
Quality Assurance Officer

cc: John Mough, Client Services Representative
Shakoora Azimi, Laboratory Director
MBT Environmental Laboratories

QA/QC
Soil Priority Pollutant and
Contingency Soil Sampling
Analytical Results

**LABORATORY PROJECT (LP) DIRECTORY FOR SOIL BORINGS AND
SURFACE SAMPLE ANALYTICAL RESULTS**

Boring	Depth (feet)	Sample ID No.	PRIORITY POLLUTANT LP #
AREA 1			
WL-101	5	WL-101-5	12351
	20	WL-101-20	--
	25	WL-101-25	12351
WL-102	5	WL-102-5	--
	15	WL-102-15	--
WL-103	5	WL-103-5	--
	10	WL-103-10	--
	15	WL-103-15	12355
	25	WL-103-25	12429
WL-104	5	WL-104-5	--
	20	WL-104-20	--
	25	WL-104-25	12355
	35	WL-104-35	12429
WL-105	10	WL-105-10	--
	30	WL-105-30	--
WL-106	0	WL-106A-0	12777
	5	WL-106A-5	--
	5 DUP (L)	WL-106A-5	--
	5 DUP (F)	WL-106B-5	--
	25	WL-106-25	--
	25 DUP (F)	WL-106B-25	--
	30	WL-106-30	12380
	30 DUP (F)	WL-106B-30	12380
WL-107	5	WL-107-5	--
	51	WL-107-80	--
	51 DUP (L)	WL-107-80	--
WL-108	5	WL-108-5	--
	22	WL-108-22	--
	30	WL-108-30	12537
WL-109	5	WL-109-5	--
	50	WL-109-50	--
	50 DUP (L)	WL-109-50	--
WL-110	5	WL-110-5	--
	50	WL-110-50	--
WL-111	0	A-8-0	12757
	5	WL-111-5	--
	5 DUP (L)	WL-111-5	--
	5 MS/MSD	WL-111-5	--
	51	WL-111-51	--
	51 DUP (L)	WL-111-51	--
	51 MS/MSD	WL-111-51	--
WL-112	0	A-14-0	12757
	5	WL-112-5	--
	42	WL-112-42	--
WL-113	5	WL-113-5	--
	5 DUP (F)	WL-113B-5	--
	10	WL-113-10	--
	45	WL-113-45	12663
WL-114	0	A-12-0	12777
	5	WL-114-5	--
	5 DUP (L)	WL-114-5	--
	5 MS/MSD	WL-114-5	--
	15	WL-115-15	--
	15 DUP (L)	WL-115-15	--
	15 MS/MSD	WL-115-15	--
WL-115	5	WL-115-5	12663
	38	WL-115-38	12663
	40	WL-115-40	--
WL-116	0	A-5-0	12757
	5	WL-116-5	--
	5 DUP (F)	WL-116B-5	--
	10	WL-116-10	--

**LABORATORY PROJECT (LP) DIRECTORY FOR SOIL BORINGS AND
SURFACE SAMPLE ANALYTICAL RESULTS**

Boring	Depth (feet)	Sample ID No.	PRIORITY POLLUTANT LP #
WL-117	10	WL-117-10	--
	25	WL-117-25	--
WL-118	5	WL-118-5	--
	10	WL-118-10	--
WL-119	5	WL-119-5	--
	50	WL-119-50	12725
	50 DUP (L)	WL-119-50	--
	50 DUP (F)	WL-119B-50	12725
	50 MS/MSD	WL-119-50	--
WL-120	5	WL-120-5	--
	50	WL-120-50	--
	50 DUP (F)	WL-120B-50	--
AREA 2			
WL-201	5	WL-201-5	--
	15	WL-201-15	--
WL-202	5	WL-202-5	--
	5 DUP (L)	WL-202-5	--
	15	WL-202-15	--
WL-203	0	B-32-0	12757
	5	WL-203-5	--
	15	WL-203-15	--
WL-204	5	WL-204-5	--
	25	WL-205-25	--
WL-205	5	WL-205-5	--
	15	WL-205-15	--
WL-206	0	B-14-0	12757
	5	WL-206-5	--
	10	WL-206-10	--
WL-207	5	WL-207-5	--
	5 DUP (L)	WL-207-5	--
	10	WL-207-10	--
WL-208	5	WL-208-5	--
	5 DUP (L)	WL-208-5	--
	9	WL-208-9	--
	15	WL-208-15	12457
	20	WL-208-20	12457
	28	WL-208-28	12457
WL-209	0	B-20-0	12777
	5	WL-209-5	--
	5 DUP (F)	WL-209B-5	--
	25	WL-209-25	--
	25 DUP (F)	WL-209B-25	--
WL-210	0	B-8-0	12777
	5	WL-210-5	--
	5 DUP (F)	WL-210B-5	--
	15	WL-210-15	12457
	40	WL-210-40	--
	40 DUP (F)	WL-210B-40	--
WL-211	5	WL-211-5	--
	25	WL-211-25	--
WL-212	5	WL-212-5	--
	10	WL-212-10	--
WL-213	0	B-16-0	--
	5	WL-213-5	--
	25	WL-213-25	12496
WL-214	5	WL-214-5	--
	25	WL-214-25	12496
WL-215	0	B-22-0	12757
WL-216	5	WL-216-5	--
	25	WL-216-25	--
WL-217	5	WL-217-5	--
	10	WL-217-10	--

**LABORATORY POLLUTANT (LP) DIRECTORY FOR SOIL BORINGS AND
SURFACE SAMPLE ANALYTICAL RESULTS**

Boring	Depth (feet)	Sample ID No.	PRIORITY POLLUTANT LP #
WL-218	0	B-5-0	12757
	5	WL-218-5	--
	25	WL-218-25	12496
	40	WL-218-40	--
WL-219	5	WL-219-5	--
	10	WL-219-10	--
WL-220	5	WL-220-5	--
	25	WL-220-25	--
WL-221	5	WL-221-5	--
	35	WL-221-35	12505
WL-222	0	B-25-0	12757
	5	WL-222-5	--
	30	WL-222-30	12505
	30 DUP (F)	WL-222B-30	12505
WL-223	5	WL-223-5	--
	22	WL-223-22	--
WL-224	5	WL-224-5	--
	35	WL-224-35	--
WL-225	5	WL-225-5	--
	35	WL-225-35	--
WL-226	10	WL-226-10	--
	20	WL-226-20	--
	43	WL-226-43	12584
	43-MS/MSD	WL-226-43	12584
WL-227	5	WL-227-5	--
	40	WL-227-40	12584
WL-228	5	WL-228-5	--
	15	WL-228-15	--
WL-229	5	WL-229-5	--
	20	WL-229-20	--
WL-230	5	WL-230-5	--
	16	WL-230-16	12599
	35	WL-230-35	12599
WL-231	0	B-31-0	12757
	5	WL-231-5	--
	10	WL-231-10	--
WL-233	27	WL-233-27	--
	30	WL-233-30	--
WL-234	10	WL-234-10	--
	10 DUP (F)	WL-234B-10	--
	20	WL-234-20	--
	20 DUP (F)	WL-234B-20	--
WL-235	0	B-6-0	12757
	5	WL-235-5	--
	30	WL-235-30	--
WL-236	5	WL-236-5	--
	35	WL-236-35	--
WL-239	5	WL-239-5	--
	25	WL-239-25	--
WL-241	5	WL-241-5	--
	15	WL-241-15	--
WL-242	0	WL-242-0.5	--
	2	WL-242-2	--
WL-243	0	WL-243	--
WL-244	0	WL-244	--
WL-245	0	WL-245	--
WL-246	0	WL-246	--

DUP (L) = Laboratory duplicate

DUP (F) = Field duplicate

MS/MSD = Matrix spike/matrix spike duplicate

-- = Not applicable

QA/QC Review of MBT Environmental
Data for West Lake Project
LP#12351

8240 Volatiles

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within control limits.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

8270 Semi-Volatiles

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within control limits.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-101-5 had all relative percent differences and percent recoveries within acceptance limits.

Laboratory Control Sample: Pentachlorophenol had a percent recovery above acceptance limits. Results for pentachlorophenol should be considered estimates (J).

8080 Pesticides/PCBs

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within acceptance limits.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-101-5 had all relative percent differences and percent recoveries within acceptance limits.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

TPH by 8015 Modified

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target petroleum products as not detected.

Laboratory Control Sample: The percent recovery was within acceptance limits for the LCS.

QA/QC Review of MBT Environmental
Data for West Lake Project
LP#12355

8240 Volatiles

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within control limits.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

8270 Semi-Volatiles

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within control limits.

Laboratory Control Sample: Pentachlorophenol had a percent recovery outside acceptance limits. Results for pentachlorophenol should be considered estimates (J).

8080 Pesticides/PCBs

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within acceptance limits.

Laboratory Control Sample: The percent recovery was within acceptance limits.

TPH by 8015 Modified

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target petroleum products as not detected.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-104-25 had its relative percent difference and percent recoveries within control limits.

Laboratory Control Sample: The percent recovery was within acceptance limits for the LCS.

QA/QC Review of MBT Environmental
Data for West Lake Project
LP#12380

8240 Volatiles

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The method blank reported target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within control limits.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-106B-30 had all relative percent differences and percent recoveries within control limits.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

8270 Semi-Volatiles

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within control limits.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-106A-30 had all relative percent differences within control limits but 2 of 22 percent recoveries outside control limits. No action is taken on MS/MSD data alone to qualify or reject an entire set of samples.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

8080 Pesticides/PCBs

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: Sample WL-106A-30 had its surrogate recovery outside acceptance limits. Results for WL-106A-30 should be considered estimates (J).

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-106A-30 had all relative percent differences within acceptance limits but 2 of 12 percent recoveries outside acceptance limits. No action is taken on MS/MSD data alone to qualify or reject an entire set of samples.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

TPH by 8015 Modified

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target petroleum products as not detected.

Laboratory Control Sample: The percent recovery was within acceptance limits for the LCS.

Priority Pollutant Metals

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target metals as not detected.

Spike Sample Recovery: Antimony (7% and 3%), beryllium (47% and 47%), cadmium (42% and 28%), chromium (53% and 49%), copper (58% and 59%), lead (44% and 50%), mercury (139% and 136%), nickel (47% and 51%), silver (40% and 34%), and zinc (53% and 66%) had percent recoveries outside control limits (75-125%) for the MS/MSD sample. Results for antimony, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc should be considered estimates (J). Negative results for antimony should be considered unusable (R).

Duplicate: Antimony (97%) and cadmium (41%) relative percent differences above the allowable maximum (35%) for the MS/MSD. Results for antimony and cadmium should be considered estimates (J).

Laboratory Control Sample: All percent recoveries were within acceptance limits for the LCS (80-120%).

Cyanide

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported cyanide as not detected.

Spike Sample Recovery: The percent recoveries (89% and 79%) were within control limits (75-125%) for the MS/MSD sample.

Duplicate: The relative percent difference (13%) was below the allowable maximum (35%) for the MS/MSD sample as required.

Laboratory Control Sample: The percent recovery (96%) was within acceptance limits for the LCS (80-120%).

QA/QC Review of MBT Environmental
Data for West Lake Project
LP#12429

8240 Volatiles

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The method blank reported target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within control limits.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-104-35 had all relative percent differences and percent recoveries within control limits.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

8080 Pesticides/PCBs

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within acceptance limits.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-104-35 had all relative percent differences and percent recoveries within acceptance limits.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

QA/QC Review of MBT Environmental
Data for West Lake Project
LP#12457

8240 Volatiles

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The medium level method blank contained a trace of acetone (720 ug/kg). Results for acetone less than ten times the blank level should be reported as not detected (U) in associated samples.

Surrogate Recovery: Samples WL-208-U and WL-210-15 had all surrogate diluted beyond detection limits. Results for samples WL-208-U and WL-210-15 should be considered estimates (J).

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-208-28 had 5 of 5 relative percent difference and 3 of 10 percent recoveries outside control limits. No action is taken on MS/MSD data alone to qualify or reject an entire set of samples.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

8270 Semi-Volatiles

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: Samples WL-208-U and WL-210-15 had all surrogate diluted beyond detection limits. Results for sample WL-208-U and WL-210-15 should be considered estimates (J).

Laboratory Control Sample: All percent recoveries were within acceptance limits.

8080 PCBs

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: Samples WL-208-U and WL210-15 had surrogate recoveries outside acceptance limits. Results for samples WL-208-U and WL-210-15 should be considered estimates (J).

Laboratory Control Sample: The percent recovery was within acceptance limits.

TPH by 8015 Modified

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target petroleum products as not detected.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-210-15 had its relative percent difference within control limits but had 1 of 2 percent recoveries outside control limits. This was due to a high concentration of diesel range material in the unspiked sample. No action is taken on MS/MSD data alone to qualify or reject an entire set of samples.

Laboratory Control Sample: The percent recovery was within acceptance limits for the LCS.

Priority Pollutant Metals

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target metals as not detected.

Spike Sample Recovery: Antimony (33% and 31%), arsenic (52% and 49%), cadmium (215%), selenium (67% and 72%), and zinc (52% and 63%) had percent recoveries outside control limits (75-125%) for the MS/MSD sample. Results for antimony, arsenic, cadmium, selenium, and zinc should be considered estimates (J).

Duplicate: Cadmium (82%) had a relative percent difference above the allowable maximum (35%) for the MS/MSD sample as required. Results for cadmium should be considered estimates (J).

Laboratory Control Sample: All percent recoveries were within acceptance limits for the LCS (80-120%).

Cyanide

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported cyanide as not detected.

Spike Sample Recovery: The percent recoveries (87 % and 99 %) were within control limits (75-125 %) for the MS/MSD sample.

Duplicate: The relative percent difference (13 %) was below the allowable maximum (35 %) for the MS/MSD sample as required.

Laboratory Control Sample: The percent recovery (102 %) was within acceptance limits for the LCS (80-120 %).

COPY

QA/QC Review of MBT Environmental
Data for West Lake Project
LP#12496

8240 Volatiles

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The medium level method blank contained a trace of acetone (720 ug/kg). Results for acetone less than ten times the blank level should be reported as not detected (U) in associated samples.

Surrogate Recovery: All surrogate recoveries were within control limits.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

8270 Semi-Volatiles

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: Sample WL-214-25 had 1 of 3 acid extractable surrogate recoveries outside control limits. Positive results for the acid extractable fraction of sample WL-214-25 should be considered estimates (J) and negative results unusable (R).

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-214-25 had all percent recoveries within control limits but 1 of 11 relative percent differences outside control limits. No action is taken on MS/MSD data alone to qualify or reject an entire set of samples.

Laboratory Control Sample: Pentachlorophenol had a percent recovery above acceptance limits. Results for pentachlorophenol should be considered estimates (J).

8080 Pesticides/PCBs

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: Sample WL-218-25 had its surrogate recovery outside acceptance limits. Results for WL-218-25 should be considered estimates (J).

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-218-25 had 2 of 6 relative percent differences and 12 of 12 percent recoveries outside acceptance limits. This was due to the high levels of contaminants in the sample and the required dilution of the sample. No action is taken on MS/MSD data alone to qualify or reject an entire set of samples.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

TPH by 8015 Modified

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target petroleum products as not detected.

Laboratory Control Sample: The percent recovery was within acceptance limits for the LCS.

Priority Pollutant Metals

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target metals as not detected.

Spike Sample Recovery: Selenium (71 % and 73 %) and thallium (71 %) had percent recoveries outside control limits (75-125 %) for the MS/MSD sample. Results for selenium and thallium should be considered estimates (J).

Duplicate: All relative percent differences were below the allowable maximum (35 %) for the MS/MSD sample as required.

Laboratory Control Sample: All percent recoveries were within acceptance limits for the LCS (80-120 %).

Cyanide

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported cyanide as not detected.

Spike Sample Recovery: The percent recoveries (92 % and 87 %) were within control limits (75-125 %) for the MS/MSD sample.

Duplicate: The relative percent difference (5 %) was below the allowable maximum (35 %) for the MS/MSD sample as required.

Laboratory Control Sample: The percent recovery (95 %) was within acceptance limits for the LCS (80-120 %).

COPY

QA/QC Review of MBT Environmental
Data for West Lake Project
LP#12505

8240 Volatiles

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within control limits.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

8270 Semi-Volatiles

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within control limits.

Laboratory Control Sample: Pentachlorophenol had a percent recovery above acceptance limits.
Results for pentachlorophenol should be considered estimates (J).

8080 Pesticides/PCBs

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: Sample WL-221-35 had its surrogate recovery outside acceptance limits.
Results for WL-221-35 should be considered estimates (J).

Laboratory Control Sample: All percent recoveries were within acceptance limits.

TPH by 8015 Modified

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target petroleum products as not detected.

Laboratory Control Sample: The percent recovery was within acceptance limits for the LCS.

Priority Pollutant Metals

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target metals as not detected.

Laboratory Control Sample: All percent recoveries were within acceptance limits for the LCS (80-120%).

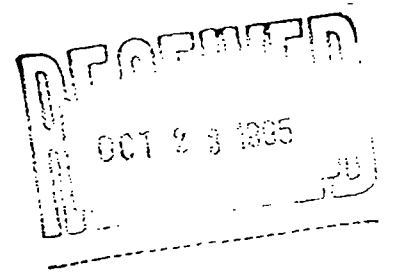
Cyanide

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported cyanide as not detected.

Laboratory Control Sample: The percent recovery (95%) was within acceptance limits for the LCS (80-120%).

QA/QC Review of MBT Environmental
Data for West Lake Project
LP#12537



8240 Volatiles

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The method blank reported target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within control limits.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-108-30 had all relative percent differences and percent recoveries within control limits.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

8270 Semi-Volatiles

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within control limits.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-108-30 had all relative percent differences within control limits but 1 of 22 percent recoveries outside control limits. No action is taken on MS/MSD data alone to qualify or reject an entire set of samples.

Laboratory Control Sample: Pentachlorophenol had a percent recovery outside acceptance limits. Results for pentachlorophenol should be considered estimates (J).

8080 Pesticides/PCBs

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within acceptance limits.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-108-30 had all relative percent differences and percent recoveries within acceptance limits.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

TPH by 8015 Modified

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target petroleum products as not detected.

Laboratory Control Sample: The percent recovery was within acceptance limits for the LCS.

Priority Pollutant Metals

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target metals as not detected.

Spike Sample Recovery: Antimony (16% and 16%) had percent recoveries outside control limits (75-125%) for the MS/MSD sample. Results for antimony should be considered estimates (J).

Duplicate: All relative percent differences were below allowable maximum (35%) for the MS/MSD as required.

Laboratory Control Sample: All percent recoveries were within acceptance limits for the LCS (80-120%).

Cyanide

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported cyanide as not detected.

Spike Sample Recovery: Cyanide (68%) had a percent recovery outside control limits (75-125%) for the MS/MSD sample. Results for cyanide should be considered estimates (J).

Duplicate: The relative percent difference (29 %) was below the allowable maximum (35 %) for the MS/MSD sample as required.

Laboratory Control Sample: The percent recovery (89 %) was within acceptance limits for the LCS (80-120 %).

QA/QC Review of MBT Environmental
Data for West Lake Project
LP#12584

8240 Volatiles

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The method blank contained traces of acetone (31 ug/kg) and toluene (2 ug/kg).
Results for acetone and toluene less than ten times the method blank level should be reported as not detected (U) in associated samples.

Surrogate Recovery: All surrogate recoveries were within control limits.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

8270 Semi-Volatiles

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within control limits.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-226-43 had all relative percent difference within control limits but had 2 of 22 percent recoveries outside control limits.
No action is taken on MS/MSD data alone to qualify or reject an entire set of samples.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

8080 Pesticides/PCBs

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within acceptance limits.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-230-35 had 2 of 6 relative percent

QA/QC Review of MBT Environmental
Data for West Lake Project
LP#12599

8240 Volatiles

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The method blank reported target compounds as not detected.

Surrogate Recovery: Sample WL-230-16 had all surrogate diluted beyond detection limits. Results for sample WL-230-16 should be considered estimates (J).

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-230-16 had 1 of 5 relative percent difference and all percent recoveries outside control limits. This was due to a high level of chlorobenzene in the unspiked sample. No action is taken on MS/MSD data alone to qualify or reject an entire set of samples.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

8270 Semi-Volatiles

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: Sample WL-230-16 had all surrogate diluted beyond detection limits. Results for sample WL-230-16 should be considered estimates (J).

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-230-35 had all relative percent difference and percent recoveries within control limits.

Laboratory Control Sample: Pentachlorophenol had a percent recovery outside acceptance limits. Results for pentachlorophenol should be considered estimates (J).

8080 Pesticides/PCBs

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

differences and 3 of 12 percent recoveries outside control limits. No action is taken on MS/MSD data alone to qualify or reject an entire set of samples.

Laboratory Control Sample: The percent recovery was within acceptance limits.

TPH by 8015 Modified

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target petroleum products as not detected.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-226-43 had its relative percent difference within control limits but had 2 of 2 percent recoveries outside control limits. This was due to a high concentration of motor oil type TPH in the unspiked sample. No action is taken on MS/MSD data alone to qualify or reject an entire set of samples.

Laboratory Control Sample: The percent recovery was within acceptance limits for the LCS.

Priority Pollutant Metals

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target metals as not detected.

Laboratory Control Sample: All percent recoveries were within acceptance limits for the LCS (80-120%).

Cyanide

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported cyanide as not detected.

Spike Sample Recovery: The percent recoveries (95% and 91%) were within control limits (75-125%) for the MS/MSD sample.

Duplicate: The relative percent difference (4%) was below the allowable maximum (35%) for the MS/MSD sample as required.

Laboratory Control Sample: The percent recovery (93%) was within acceptance limits for the LCS (80-120%).

Surrogate Recovery: All surrogate recoveries were within acceptance limits.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-230-35 had all relative percent difference and percent recoveries within control limits.

Laboratory Control Sample: The percent recovery was within acceptance limits.

TPH by 8015 Modified

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target petroleum products as not detected.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-230-16 had its relative percent difference within control limits but had 2 of 2 percent recoveries outside control limits. This was due to a high concentration of motor oil type TPH in the unspiked sample. No action is taken on MS/MSD data alone to qualify or reject an entire set of samples.

Laboratory Control Sample: The percent recovery was within acceptance limits for the LCS.

Priority Pollutant Metals

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target metals as not detected.

Spike Sample Recovery: Antimony (45% and 40%), arsenic (55% and 42%), cadmium (267%), copper (13% and 0%), lead (59% and 54%), mercury (140% and 128%), selenium (74%), thallium (56% and 66%), and zinc (372% and 130%) had percent recoveries outside control limits (75-125%) for the MS/MSD sample. Results for antimony, arsenic, cadmium, copper, lead, mercury, selenium, thallium, and zinc should be considered estimates (J). Negative results for copper should be considered unusable (R).

Duplicate: Cadmium (89%) and zinc (48%) had relative percent differences above the allowable maximum (35%) for the MS/MSD sample as required. Results for cadmium and zinc should be considered estimates (J).

Laboratory Control Sample: All percent recoveries were within acceptance limits for the LCS (80-120%).

Cyanide

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported cyanide as not detected.

Spike Sample Recovery: The percent recoveries (103 % and 97 %) were within control limits (75-125 %) for the MS/MSD sample.

Duplicate: The relative percent difference (6 %) was below the allowable maximum (35 %) for the MS/MSD sample as required.

Laboratory Control Sample: The percent recovery (93 %) was within acceptance limits for the LCS (80-120 %).

QA/QC Review of MBT Environmental
Data for West Lake Project
LP#12663

8240 Volatiles

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The medium level method blank contained methylene chloride (720 ug/kg). Results for methylene chloride below ten times the highest associated blank should be reported as not detected (U) in samples.

Surrogate Recovery: Sample WL-115-5 had 1 of 3 surrogate recoveries outside control limits. Results for sample WL-115-5 should be considered estimates (J).

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-115-5 had all relative percent differences within control limits but had 4 of 10 percent recoveries outside control limits. This was due to a high level of toluene in the unspiked sample. No action is taken on MS/MSD data alone to qualify or reject an entire set of samples.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

8270 Semi-Volatiles

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within control limits.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-113-45 had all relative percent differences within control limits but had 1 of 22 percent recoveries outside control limits. No action is taken on MS/MSD data alone to qualify or reject an entire set of samples.

Laboratory Control Sample: Pentachlorophenol had a percent recovery outside acceptance limits. Results for pentachlorophenol should be considered estimates (J).

8080 Pesticides/PCBs

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: Sample WL-115-5 had its surrogate recovery outside acceptance limits and below 10%. Positive results for sample WL-115-5 should be considered estimates (J) and negative results unusable (R).

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-113-45 had all relative percent differences and percent recoveries within control limits.

Laboratory Control Sample: The percent recoveries were within acceptance limits.

TPH by 8015 Modified

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target petroleum products as not detected.

Laboratory Control Sample: The percent recovery was within acceptance limits for the LCS.

Priority Pollutant Metals

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target metals as not detected.

Spike Sample Recovery: Cadmium (65% and 71%) and mercury (158%) had percent recoveries outside control limits (75-125%) for MS/MSD sample WL-113-45. Results for cadmium and mercury should be considered estimates (J).

Duplicate: All relative percent differences were below the allowable maximum (35%) for the MS/MSD sample WL-113-45 as required.

Laboratory Control Sample: All percent recoveries were within acceptance limits for the LCS (80-120%).

Cyanide

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported cyanide as not detected.

Spike Sample Recovery: The percent recoveries (92 % and 92 %) were within control limits (75-125 %) for the MS/MSD sample.

Duplicate: The relative percent difference (0 %) was below the allowable maximum (35 %) for the MS/MSD sample as required.

Laboratory Control Sample: The percent recovery (101 %) was within acceptance limits for the LCS (80-120 %).

QA/QC Review of MBT Environmental
Data for West Lake Project
LP#12725

8240 Volatiles

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within control limits.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-119B-50 had all relative percent differences and percent recoveries within control limits.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

8270 Semi-Volatiles

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blanks reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within control limits.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

8080 Pesticides/PCBs

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within acceptance limits.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-119-50 had 1 of 6 relative percent differences and 1 of 12 percent recoveries outside control limits. No action is taken on MS/MSD data alone to qualify or reject an entire set of samples.

Laboratory Control Sample: The percent recovery was within acceptance limits.

TPH by 8015 Modified

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target petroleum products as not detected.

Laboratory Control Sample: The percent recovery was within acceptance limits for the LCS.

Priority Pollutant Metals

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target metals as not detected.

Laboratory Control Sample: All percent recoveries were within acceptance limits for the LCS (80-120%).

Cyanide

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported cyanide as not detected.

Spike Sample Recovery: The percent recoveries (101% and 105%) were within control limits (75-125%) for the MS/MSD sample.

Duplicate: The relative percent difference (3%) was below the allowable maximum (35%) for the MS/MSD sample as required.

Laboratory Control Sample: The percent recovery (92%) was within acceptance limits for the LCS (80-120%).

COPY

QA/QC Review of MBT Environmental
Data for West Lake Project
LP#12757

8240 Volatiles

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The method blanks reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within control limits.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample A-5-0V had all relative percent differences and percent recoveries within control limits.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

8270 Semi-Volatiles

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: Sample B-22-0V had all its surrogates diluted beyond detection limits. Results for sample B-22-0V should be considered estimates (J).

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample A-14-0V had all relative percent differences within control limits but had 2 of 22 percent recoveries outside control limits. No action is taken on MS/MSD data alone to qualify or reject an entire set of samples.

Laboratory Control Sample: Pentachlorophenol had a percent recovery outside acceptance limits. Results for pentachlorophenol should be considered estimates (J).

8080 Pesticides/PCBs

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: Samples B-22-0 and B-31-0 had surrogates diluted beyond detection limits. Results for samples B-22-0 and B-31-0 should be considered estimates (J).

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample A-5-0 had all relative percent differences and percent recoveries within control limits.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

TPH by 8015 Modified

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target petroleum products as not detected.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample B-6-0 had the relative percent difference and percent recoveries within acceptance limits.

Laboratory Control Sample: The percent recovery was within acceptance limits for the LCS.

Priority Pollutant Metals

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target metals as not detected.

Spike Sample Recovery: Antimony (13 % and 3 %), arsenic (24 % and 40 %), chromium (165 %), copper (188 %), mercury (126 %), nickel (128 %), silver (70 %), thallium (74 % and 65 %), and zinc (214 %) had percent recoveries outside control limits (75-125 %) for the MS/MSD sample. Results for antimony, arsenic, chromium, copper, mercury, nickel, silver, thallium, and zinc should be considered estimates (J). Negative results for antimony should be considered unusable (R).

Duplicate: Antimony (123%) copper (35%), and zinc (43%) had relative percent differences above the allowable maximum (35%) for the MS/MSD sample. Results for antimony, copper, and zinc should be considered estimates (J).

Laboratory Control Sample: All percent recoveries were within acceptance limits for the LCS (80-120%).

Cyanide

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported cyanide as not detected.

Spike Sample Recovery: The percent recoveries (94% and 96%) were within control limits (75-125%) for the MS/MSD sample.

Duplicate: The relative percent difference (2%) was below the allowable maximum (35%) for the MS/MSD sample as required.

Laboratory Control Sample: The percent recovery (99%) was within acceptance limits for the LCS (80-120%).

QA/QC Review of MBT Environmental
Data for West Lake Project
LP#12777

8240 Volatiles

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The method blanks reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within control limits.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample B-20-0V had all relative percent differences and percent recoveries within control limits.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

8270 Semi-Volatiles

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within control limits.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample A-11-0V had all relative percent differences and percent recoveries within control limits.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

8080 Pesticides/PCBs

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within acceptance limits.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample A-11-0 had all relative percent differences within control limits but had 4 of 12 percent recoveries outside control limits. No action is taken on MS/MSD data alone to qualify or reject an entire set of samples.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

TPH by 8015 Modified

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target petroleum products as not detected.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample B-20-0 had the relative percent difference within acceptance limits but had 1 of 2 percent recoveries outside acceptance limits. No action is taken on MS/MSD data alone to qualify or reject an entire set of samples.

Laboratory Control Sample: The percent recovery was within acceptance limits for the LCS.

Priority Pollutant Metals

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target metals as not detected.

Spike Sample Recovery: Mercury (94% and 97%) had percent recoveries within control limits (75-125%) for the MS/MSD sample as required.

Duplicate: Mercury (1%) had a relative percent difference below the allowable maximum (35%) for the MS/MSD sample as required.

Laboratory Control Sample: All percent recoveries were within acceptance limits for the LCS (80-120%).

Cyanide

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported cyanide as not detected.

Laboratory Control Sample: The percent recovery (99 %) was within acceptance limits for the LCS (80-120%).

QA/QC
Perched Water Priority
Pollutant and Leachate
IndicatorParameter Sampling
Analytical Results

**LABORATORY PROJECT (LP) DIRECTORY FOR CONTINGENCY GRAB
PERCHED WATER ANALYTICAL RESULTS**

Boring	Depth (feet)	Sample ID No.	PRIORITY POLLUTANT LP #
CONTINGENCY GRAB PERCHED WATER			
WL-108	22	WL-108-22	12511
WL-219	25	WL-219-25	12497&12498
WL-220	20	WL-220-20	--
WL-231	31	WL-231-31	12591

-- = Not applicable

QA/QC Review of MBT Environmental
Data for West Lake Project
LP#12497

Total Phosphate

Holding Times: Samples were analyzed within holding times.

Blanks: The method blank reported phosphate as not detected.

Spike Sample Recovery: The unspiked sample (26 mg/L) had greater than four times the level of the spike added (0.919 mg/L) therefore the recoveries generated are not applicable for this parameter.

Duplicate: The relative percent difference (3%) was below the allowable maximum (20%) for the MS/MSD samples as required.

Laboratory Control Sample: The percent recovery (100%) was within acceptance limits for the LCS (80-120%).

Nitrate

Holding Times: Samples were analyzed within holding times.

Blanks: The method blank reported nitrate as not detected.

Spike Sample Recovery: The percent recoveries (79% and 113%) were within control limits (75-125%) for the MS/MSD sample.

Duplicate: The relative percent difference (35%) was at the allowable maximum (20%) for the MS/MSD samples as required.

Laboratory Control Sample: The percent recovery (96%) was within acceptance limits for the LCS (80-120%).

Nitrite

Holding Times: Samples were analyzed within holding times.

Blanks: The method blank reported nitrite as not detected.

Spike Sample Recovery: Nitrite (64% and 67%) had percent recoveries outside control limits (75-125%) for the MS/MSD sample. Results for nitrite should be considered estimates (J) in associated samples.

Duplicate: The relative percent difference (2%) was below the allowable maximum (20%) for the MS/MSD samples as required.

Laboratory Control Sample: The percent recovery (100%) was within acceptance limits for the LCS (80-120%).

Total Organic Carbon (TOC)

Holding Times: Samples were analyzed within holding times.

Blanks: The method blank reported TOC as not detected.

Laboratory Control Sample: The percent recovery (96%) was within acceptance limits for the LCS (80-120%).

Chemical Oxygen Demand (COD)

Holding Times: Samples were analyzed within holding times.

Blanks: The method blank reported COD as not detected.

Laboratory Control Sample: The percent recovery (109%) was within acceptance limits for the LCS (80-120%).

Sulfide

Holding Times: Samples were analyzed within holding times.

Blanks: The method blank reported sulfide as not detected.

Spike Sample Recovery: The percent recoveries (100% and 93%) were within control limits (75-125%) for the MS/MSD sample.

Duplicate: The relative percent difference (7%) was below the allowable maximum (20%) for the MS/MSD samples as required.

Laboratory Control Sample: The percent recovery (100%) was within acceptance limits for the LCS (80-120%).

Chloride

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The method blank reported chloride as not detected.

Spike Sample Recovery: The percent recoveries (100% and 96%) were within control limits (75-125%) for the MS/MSD sample.

Duplicate: The relative percent difference (1%) was below the allowable maximum (20%) for the MS/MSD samples as required.

Laboratory Control Sample: The percent recovery (100%) was within acceptance limits for the LCS (80-120%).

QA/QC Review of Analab Analytical
Laboratory Data for West Lake Project
MBT LP#12497

Biochemical Oxygen Demand (BOD)

Holding Times: Samples were analyzed within holding times.

Blanks: The method blank reported BOD as not detected.

Laboratory Control Sample: The percent recovery was within acceptance limits (80-120%) for the LCS.

Ammonia

Holding Times: Samples were within holding times.

Blanks: The method blank reported BOD as not detected.

Laboratory Control Sample: The percent recovery (101 %) was within acceptance limits for the LCS (80-120%).

QA/QC Review of MBT Environmental
Data for West Lake Project
LP#12498

8240 Volatiles

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The method blank contained a trace of acetone (4.2 ug/L). Results for acetone less than ten times the method blank level should be reported as not detected (U) in associated samples.

Surrogate Recovery: All surrogate recoveries were within control limits.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-219-25 had all relative percent differences and percent recoveries within control limits.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

8270 Semi-Volatiles

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within control limits.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-219-25 had all relative percent differences and percent recoveries within control limits.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

8080 PCBs

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within acceptance limits.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-231-31 had its relative percent differences within control limits but had 2 of 2 percent recoveries outside control limits. No action is taken on MS/MSD data alone to qualify or reject an entire set of samples.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

TPH by 8015 Modified

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The method blank reported target petroleum products as not detected.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-231-31 had the relative percent difference within control limits but had 1 of 2 percent recoveries outside control limits. No action is taken on MS/MSD data alone to qualify or reject an entire set of samples.

Laboratory Control Sample: The percent recovery was within acceptance limits for the LCS.

Priority Pollutant Metals

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target metals as not detected.

Spike Sample Recovery: Arsenic (62% and 64%), selenium (37% and 44%), and thallium (65% and 52%) had percent recoveries outside control limits (75-125%) for the MS/MSD. Results for arsenic, selenium, and thallium should be considered estimates (J).

Duplicates: All relative percent differences were below the allowable maximum (35%) for the MS/MSD sample as required.

Laboratory Control Sample: All percent recoveries were within acceptance limits for the LCS (80-120%).

Chloride

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The method blank reported chloride as not detected.

Laboratory Control Sample: The percent recovery (94 %) was within acceptance limits for the LCS (80-120%).

Cyanide

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The method blank reported cyanide as not detected.

Laboratory Control Sample: The percent recovery (96%) was within acceptance limits for the LCS (80-120%).

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8240 Volatiles

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within control limits.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

8270 Semi-Volatiles

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: Sample WL-108-22 had 2 of 3 base/neutral surrogate recoveries outside control limits. Results for the base/neutral fraction of sample WL-108-22 should be considered estimates (J).

Laboratory Control Sample: All percent recoveries were within acceptance limits.

8080 Pesticides/PCBs

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: Sample WL-108-22 had its surrogate recovery outside acceptance limits. Results for WL-108-22 should be considered estimates (J).

Laboratory Control Sample: All percent recoveries were within acceptance limits.

TPH by 8015 Modified

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The method blank reported target petroleum products as not detected.

Laboratory Control Sample: The percent recovery was within acceptance limits for the LCS.

Priority Pollutant Metals

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target metals as not detected.

Laboratory Control Sample: All percent recoveries were within acceptance limits for the LCS (80-120%).

Total Phosphate

Holding Times: Samples were analyzed within holding times.

Blanks: The method blank reported phosphate as not detected.

Laboratory Control Sample: The percent recovery (100%) was within acceptance limits for the LCS (80-120%).

Nitrate

Holding Times: Samples were analyzed within holding times.

Blanks: The method blank reported nitrate as not detected.

Laboratory Control Sample: The percent recovery (96%) was within acceptance limits for the LCS (80-120%).

Nitrite

Holding Times: Samples were analyzed within holding times.

Blanks: The method blank reported nitrite as not detected.

Spike Sample Recovery: The percent recoveries (96% and 99%) were within control limits (75-125%) for the MS/MSD sample.

Duplicate: The relative percent difference (3%) was below the allowable maximum (20%) for the MS/MSD samples as required.

Laboratory Control Sample: The percent recovery (101%) was within acceptance limits for the LCS (80-120%).

Total Organic Carbon (TOC)

Holding Times: Samples were analyzed within holding times.

Blanks: The method blank reported TOC as not detected.

Spike Sample Recovery: The percent recoveries (100% and 113%) were within control limits (75-125%) for the MS/MSD sample.

Duplicate: The relative percent difference (6%) was below the allowable maximum (20%) for the MS/MSD samples as required.

Laboratory Control Sample: The percent recovery (96%) was within acceptance limits for the LCS (80-120%).

Chemical Oxygen Demand (COD)

Holding Times: Samples were analyzed within holding times.

Blanks: The method blank reported COD as not detected.

Spike Sample Recovery: The percent recoveries were not applicable for the MS/MSD sample because the unspiked sample contained a concentration (1400 mg/L) greater than four times the spiking level (25 mg/L).

Duplicate: The relative percent difference (2%) was below the allowable maximum (20%) for the MS/MSD samples as required.

Laboratory Control Sample: The percent recovery (109%) was within acceptance limits for the LCS (80-120%).

Sulfide

Holding Times: Samples were analyzed within holding times.

Blanks: The method blank reported sulfide as not detected.

Spike Sample Recovery: The percent recoveries (100% and 93%) were within control limits (75-125%) for the MS/MSD sample.

Duplicate: The relative percent difference (7%) was below the allowable maximum (20%) for the MS/MSD samples as required.

Laboratory Control Sample: The percent recovery (93%) was within acceptance limits for the LCS (80-120%).

Chloride

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The method blank reported chloride as not detected.

Laboratory Control Sample: The percent recovery (100%) was within acceptance limits for the LCS (80-120%).

Cyanide

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The method blank reported cyanide as not detected.

Laboratory Control Sample: The percent recovery (88%) was within acceptance limits for the LCS (80-120%).

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Biochemical Oxygen Demand (BOD)

Holding Times: Sample WL-108-22 was analyzed outside holding times. Results for sample WL-108-22 should be considered estimates (J).

Blanks: The method blank reported BOD as not detected.

Laboratory Control Sample: The percent recovery was within acceptance limits (80-120%) for the LCS.

Ammonia

Holding Times: Samples were analyzed within holding times.

Blanks: The method blank reported BOD as not detected.

Laboratory Control Sample: The percent recovery (101%) was within acceptance limits for the LCS (80-120%).

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8240 Volatiles

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: All surrogate recoveries were within control limits.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-231-31 had all relative percent differences and percent recoveries within control limits.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

8270 Semi-Volatiles

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: Sample WL-231-31 had 1 of 3 base/neutral surrogate recoveries outside control limits but not below 10%. No action is taken on only one surrogate per fraction outside control limits as long as no recovery is below 10%.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-231-31 had all relative percent differences within control limits but had 8 of 22 percent recoveries outside control limits. No action is taken on MS/MSD data alone to qualify or reject an entire set of samples.

Laboratory Control Sample: Pentachlorophenol had a percent recovery outside acceptance limits. Results for pentachlorophenol should be considered estimates (J).

8080 Pesticides/PCBs

Holding Times: Samples were extracted and analyzed within SW-846 holding times.

Blanks: The method blank reported all target compounds as not detected.

Surrogate Recovery: Sample WL-231-31 had its surrogate recovery outside acceptance limits. Results for WL-231-31 should be considered estimates (J).

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-231-31 had 4 of 5 relative percent differences and 7 of 11 percent recoveries outside control limits. No action is taken on MS/MSD data alone to qualify or reject an entire set of samples.

Laboratory Control Sample: All percent recoveries were within acceptance limits.

TPH by 8015 Modified

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The method blank reported target petroleum products as not detected.

Matrix Spike/Matrix Spike Duplicate: MS/MSD sample WL-231-31 had the relative percent difference and percent recoveries within control limits.

Laboratory Control Sample: The percent recovery was within acceptance limits for the LCS.

Priority Pollutant Metals

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: Method blanks reported target metals as not detected.

Spike Sample Recovery: Cadmium (65%), selenium (20% and 22%), and thallium (54% and 57%) had percent recoveries outside control limits (75-125%) for the MS/MSD. Results for cadmium, selenium, and thallium should be considered estimates (J).

Duplicates: All relative percent differences were below the allowable maximum (35%) for the MS/MSD sample as required.

Laboratory Control Sample: All percent recoveries were within acceptance limits for the LCS (80-120%).

Total Phosphate

Holding Times: Samples were analyzed within holding times.

Blanks: The method blank reported phosphate as not detected.

Spike Sample Recovery: Phosphate (5 % and 11 %) had percent recoveries outside control limits (75-125 %) for the MS/MSD sample. Results for phosphate should be considered estimates (J).

Duplicate: The relative percent difference (3 %) was below the allowable maximum (20 %) for the MS/MSD samples as required.

Laboratory Control Sample: The percent recovery (93 %) was within acceptance limits for the LCS (80-120 %).

Nitrate

Holding Times: Samples were analyzed within holding times.

Blanks: The method blank reported nitrate as not detected.

Spike Sample Recovery: The percent recoveries (100 % and 104 %) were within control limits (75-125 %) for the MS/MSD sample.

Duplicate: The relative percent difference (4 %) was below the allowable maximum (20 %) for the MS/MSD samples as required.

Laboratory Control Sample: The percent recovery (98 %) was within acceptance limits for the LCS (80-120 %).

Nitrite

Holding Times: Samples were analyzed within holding times.

Blanks: The method blank reported nitrite as not detected.

Spike Sample Recovery: The percent recoveries (76 % and 78 %) were within control limits (75-125 %) for the MS/MSD sample.

Duplicate: The relative percent difference (2 %) was below the allowable maximum (20 %) for the MS/MSD samples as required.

Laboratory Control Sample: The percent recovery (98 %) was within acceptance limits for the LCS (80-120 %).

Total Organic Carbon (TOC)

Holding Times: Samples were analyzed within holding times.

Blanks: The method blank reported TOC as not detected.

Laboratory Control Sample: The percent recovery (95 %) was within acceptance limits for the LCS (80-120 %).

Chemical Oxygen Demand (COD)

Holding Times: Samples were analyzed within holding times.

Blanks: The method blank reported COD as not detected.

Laboratory Control Sample: The percent recovery (91 %) was within acceptance limits for the LCS (80-120 %).

Sulfide

Holding Times: Samples were analyzed within holding times.

Blanks: The method blank reported sulfide as not detected.

Spike Sample Recovery: The percent recoveries (100 % and 93 %) were within control limits (75-125 %) for the MS/MSD sample.

Duplicate: The relative percent difference (7 %) was below the allowable maximum (20 %) for the MS/MSD samples as required.

Laboratory Control Sample: The percent recovery (93 %) was within acceptance limits for the LCS (80-120 %).

Chloride

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The method blank reported chloride as not detected.

Spike Sample Recovery: The percent recoveries (100% and 98%) were within control limits (75-125%) for the MS/MSD sample.

Duplicate: The relative percent difference (1%) was below the allowable maximum (20%) for the MS/MSD samples as required.

Laboratory Control Sample: The percent recovery (94%) was within acceptance limits for the LCS (80-120%).

Cyanide

Holding Times: Samples were analyzed within SW-846 holding times.

Blanks: The method blank reported cyanide as not detected.

Spike Sample Recovery: The percent recoveries (85% and 79%) were within control limits (75-125%) for the MS/MSD sample.

Duplicate: The relative percent difference (6%) was below the allowable maximum (20%) for the MS/MSD samples as required.

Laboratory Control Sample: The percent recovery (88%) was within acceptance limits for the LCS (80-120%).

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Biochemical Oxygen Demand (BOD)

Holding Times: Samples were analyzed within holding times.

Blanks: The method blank reported BOD as not detected.

Laboratory Control Sample: The percent recovery (110%) was within acceptance limits (80-120%) for the LCS.

Ammonia

Holding Times: Samples were within holding times.

Blanks: The method blank reported BOD as not detected.

Laboratory Control Sample: The percent recovery (100%) was within acceptance limits for the LCS (80-120%).